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The Journal of Obstetrics and Gynæcology of the British Empire

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On the Involution of the Uterus Post-Partum.

By JOHN H. TEACHER, M.A., M.D., (Glas.)

St. Mungo (Notman) Professor of Pathology in the University of Glasgow and Pathologist to Glasgow Royal Infirmary.

THE decidua, as defined by William Hunter, "is an efflorescence of the internal coat of the uterus itself, and is, therefore, shed as often as a woman bears a child or suffers a miscarriage. It is of considerable thickness and one stratum of it is always left on the uterus after delivery, most of which dissolves and comes away with the lochia." The fate of the mucous membrane which remains, and the process by which the uterus is restored to condition fit for resuming its function have interested the writer for many years, but the decision to write on the subject was brought about through his being asked to examine and report upon the uterus from a case of alleged criminal abortion.

The case turned principally upon the interpretation of the condition of the uterus—whether it indicated that abortion had occurred about a fortnight as alleged, or about a month ante-mortem.

The body was exhumed after six weeks. The autopsy was made with little knowledge of the history of the case, except that criminal abortion by drugs or operation was suspected. Abdominal section had been performed shortly before death.

The relevant facts ascertained by the post-mortem examination were as follows:—

The cause of death was acute peritonitis, which was regarded as having originated from the uterus or Fallopian tubes in consequence of septic infection connected with the abortion. The uterus, however, did not appear to be septic. Its cavity was considerably above the normal size. There was a small, shallow hole in the lining membrane of the posterior wall a little above the os internum, which was taken to be a wound made with a thin pointed instrument during the procuring of the abortion. There

A

was a cyst of the right ovary the nature of which could not be determined.

The contents of the pelvis were removed *en masse* and placed in formalin. The writer was not present at the post-mortem, but was present at the subsequent examination of the specimen.

Macroscopic examination after hardening in formalin. The internal surfacé of the uterus was smooth as if denuded of decidua, except at one small area. This area was somewhat prominent, circular and about half an inch in diameter, and was regarded by all present at the examination as a remnant of decidua. The appearances suggested recent abortion at about the end of the third month. The cyst of the ovary, which was ruptured, had a thick wall in which the Fallopian tube was embedded. The little hole in the lining membrane looked like a wound. When the history of the case disclosed that the illegal operation could not have been performed less than 11 days ante-mortem, such an interpretation became extremely improbable. The patient had been ill for about a fortnight, and had been under medical observation for 11 days. A few days before death the diagnosis of acute bi-lateral salpingo-oöphoritis was made. On the day before the death of the patient the abdomen was opened, and acute general peritonitis was found, whereupon nothing further than drainage was attempted.

Microscopic examination. The preservation of the tissues was surprisingly good. The sections revealed a state of affairs totally different from that suggested by the naked eye appearances. The uterus was not denuded internally, but was lined by resting endometrium. A few large cells around the large blood vessels represented all that remained of decidua. Chorionic giant cells could not be found. The glands were short, well formed and regular, and the stroma, except as noted above, was characteristic of the interval phase. Restoration of the mucous membrane was, therefore, far advanced. The prominent area had been the placental site. Organization was advanced in the thrombi in the large vessels. There was very little dead matter. The large size of the uterus was doubtless, to a great extent, due to sub-involution, the patient having borne several children. The supposed wound was not a wound made during life.

From a study of the available sections and of the literature of the subject, the writer formed the opinion that abortion must have occurred not less than four weeks prior to death. Much material bearing on this problem has since been obtained and examined, and a study of it confirms that opinion.

Further, the uterus was free from septic disease and could not have been the source of the acute peritonitis. The supposed cyst, however, was an abscess in the right ovary, and the right Fallopian tube showed early suppuration. The left Fallopian tube was normal. It is almost certain that the peritonitis resulted from rupture of the ovarian abscess into the peritoneal cavity: it was the last and most acute phase of the illness. As the septic process involved only the right appendages, the possibility that it had arisen from the appendix was suggested, although at the autopsy (at which I was not present), that organ had been noted as normal.

In view of the above findings the proof that death had resulted from an illegal operation was held to have broken down.

Good general accounts of the involution of the gravid uterus can be obtained in textbooks, but reasonably exact time *data* are difficult to find. An excellent account of the ripe placenta and the conditions immediately preceding birth is given by Grosser in Keibel & Mall's System of Embryology, Vol. 1, and he also gives a good short account of the uterus post-partum, founded principally on the work of Wormser.

According to Grosser (private communication recently), Wormser's very full article in the *Archiv für Gynäkologie*, although written in 1903, is still the fullest and most reliable monograph on the subject. Wormser worked in the Obstetric Clinic of Basle with very abundant material obtained principally by the curettage of patients who showed symptoms which suggested infection, or who suffered from hæmorrhage in the days following confinement. Most of the specimens date from the first to the eleventh day, but there are also many at later dates. In addition, Wormser has eight uteri mostly obtained under very favourable conditions. His material practically finishes at the 23rd day. Much of it is related to pathological conditions, but the comparison of these with the apparently healthy, brings out many points of interest, and is of importance, because the cases which give difficulty are very commonly abnormal. Wormser shows, and we can confirm his observations, that the process of involution proceeds almost uninterruptedly in spite of slight infection or wasting disease, and may go on even in the presence of severe infection. On the other hand, much delay and great variation in the processes of repair can result from the retention of fragments of placenta or membrane.

Portions of membrane may adhere to any part of the interior of the uterus, especially at term, but most commonly the remains of the ovum are attached to the placental site. At the area of attachment the course of restoration may be greatly disturbed while

it may go on rapidly elsewhere. Consequently in examining a uterus, it is essential to examine the placental site, the region of the decidua vera and any point in the latter where there is an irregularity suggestive of adherent membrane.

Wormser also discusses cases which have been described under the designation "precocious regeneration of the endometrium." It has been asserted that fully reformed mucous membrane may be present within a few days after abortion. Wormser rejects these cases as unreliable, an opinion with which I agree. In such cases as have come under my observation the clinical history is at fault and the true nature of the case has been determined by microscopic investigation, see page 7.

The time occupied by involution may, therefore, vary greatly. Different areas of the same uterus, even, may show different degrees of regeneration. Nevertheless, in my opinion, dates sufficiently accurate to be valuable for the purpose of this paper can be given. The period which is occupied by normal involution of the uterus is bound to be fairly regular. It is probably longer than the older estimates have it, just as the newer lore of the implantation of the human ovum has shown that the old estimates of the ages of ova require to be very considerably increased.

Wormser gives brief clinical histories of all his cases and then describes the histological appearances in great detail. There may be half a dozen or more cases of the same date but differing in history and giving a histological picture different in detail. There is a useful brief extract of each case. There is also a lengthy discussion of the older literature and a general account of his own research. The last, in particular, is valuable but it has been carried out from a different standpoint from the present paper. It is extremely difficult to abstract from this mass of material the general principles and give a general account of the process, which will not on the one hand be too rigid, or on the other hand, be burdened with too much detail. The investigator dealing with a particular case should consult Wormser's records, as the great variety and wealth of detail given would probably enable him to make some useful comparison

Following Wormser, a general statement of the chronology of involution of the uterus might be given as follows:—

The first stage is the formation of a line of demarcation between tissue which is to survive and form the basis of the new mucous membrane, and tissue that is to undergo necrosis and be cast off. This begins to be recognizable as early as the second day and is quite clear by the sixth day. By the tenth or eleventh day the process of cleansing is well advanced in the region of the decidua

vera, and proliferative changes leading up to the reformation of the mucous membrane are very evident. The membrane is still essentially remains of decidua; but parts of the surface have become covered with irregular epithelium, which Wormser describes as a "provisional wound cover." The remainder may be compared to a granulating surface, either cleared or with masses of dead material still adhering.

The fourteenth day, on the average, may be taken as the turning point. The old decidua has practically disappeared and the new endometrium is beginning to emerge. At this period, the lining membrane is a very thin, irregular layer, probably thinner than at an earlier period. Decidua cells may still be recognizable in the superficial layers but they are degenerate survivors, and the stroma largely has resumed the endometrial characters. The glands are few in number, irregular in shape and set at various angles to the surface, which, although very irregular, is for the most part covered by epithelium. The epithelium has obviously grown from the mouths of glands and is beginning to show the normal character in places. Towards the end of the third week the mucous membrane may fairly be designated "endometrium," but it is thin and immature. It is not, therefore, in my opinion, fully reconstituted. It is not restored to the normal even at six weeks, although it may be fit to become the seat of a new pregnancy.

In the situation at which the placenta was attached, Wormser finds that the processes of cleansing and repair are essentially the same as in the decidua vera region, but there is more dead matter to be dealt with and that of a more resistant type. Regeneration, therefore, takes longer, and the placental site may be identifiable in sections by the presence of the remains of large blood vessels and pigmented phagocytes up to two months, even in circumstances which appear normal and favourable to involution.

The interior of the uterus in the first place is occupied by a thick mass of blood clot. This is easily stripped from the decidua vera but is more adherent at the placental site as the clots are continuous with the thrombi in the torn ends of the large utero-placental blood vessels. As in the decidua vera a line of separation is formed, but, owing largely to the presence of these large vessels, it is very irregular and the muscular wall is often exposed. The clots and dead material are cast off by a process which appears to be largely that of solution or digestion, and there is much exudation of serum forming the basis of the lochia. Quite apart from infection there is abundant emigration of leucocytes, which doubtless play an important part in the solution and loosening of the material which is to be shed. The blood clots are shed as such or become softened and break down. The dead tissue in part is

separated as visible sloughs or breaks down and dissolves, but in part it becomes enclosed in the new mucous membrane and eventually is absorbed. This applies particularly to the ends of the large blood vessels. The process of cleansing and the earlier phases of reformation of the endometrium present strong resemblance to the healing of a wound by granulation.

The following *data* in regard to the lochia and to the duration of the involution of the uterus are taken from Fraenkel's chapter in Liepmann's Handbook of Gynæcology.

The clots break down causing the lochia to be bloody in the early days. Later, shreds of tissue may be found in it but, as a rule, gross masses of tissue are not recognizable. Leucocytes are always present in large numbers. By the sixth day the bulk of the dead material has been shed and the normal secretions, especially from the cervical glands, begin to make their appearance. By the tenth day the lochia has become a white fluid composed of serum and mucus, and contains numerous leucocytes. Micro-organisms of various kinds are very commonly present but do not necessarily indicate infection, although the organisms may be of pathogenic types. The discharge soon loses its cellular or purulent character and settles down to the normal mucus. The time of its cessation is very variable.

Fraenkel agrees with Wormser that the duration of involution varies exceedingly from individual characteristics and from chance, such as retention of membrane, and that it goes on well in spite of the presence of organisms and even of actual infection. In the absence of lactation the first period comes as a rule after about six weeks, which may be taken as the normal end of involution. It may come normally as early as the fourth or fifth week or may be delayed as long as twelve weeks. Ripe follicles have been observed in the ovary at about the end of one month. According to current theory, this also would indicate six weeks as the normal period for the resumption of menstruation in the event of the ovum not being fertilized.

The process of involution has to be considered also in relation to miscarriage at early stages. In my opinion, it is probable that restoration is more rapidly effected in the case of early abortions (up to the third month) than at later stages, as there is less to be done to bring the uterus back to normal. Menstruation, therefore, might also be resumed at an earlier date. More information is, however, required regarding the early months and the middle period. From the sixth or seventh month onwards the time occupied is doubtless much the same as at term.

On the other hand, retention of parts of the product of conception is more frequent in the early stages, thus producing variation and delay. The influence of these is most likely to affect the placental area, while in other areas the regeneration of the endometrium proceeds on more or less normal lines. It is, therefore, not uncommon to find in a curetting (1) well formed endometrium, (2) well preserved chorionic villi usually associated with well preserved decidua and (3) degenerate or necrotic remains of chorionic villi and decidua.

In illustration of the above, two cases may be described which also throw light on the question of precocious regeneration of the endometrium referred to on page 4.

A woman, aged 21, died from lobar pneumonia after nine days' illness. Abortion was stated to have taken place on the seventh day of disease. The uterus was considerably enlarged and congested. The cavity contained a mass of thick, folded membrane, which was apparently decidua in process of being shed. On microscopic examination this was found to be necrotic material infiltrated with leucocytes. A few very degenerate chorionic villi were found, and at one point some fairly characteristic decidua. The mucous membrane generally was, however, well formed endometrium with long regular glands. The dead matter was adherent to the surface which it dragged away on the opening of the uterus, splitting the endometrium. This was clearly an example of an old placental mole with advanced general reconstitution of the endometrium. The history was totally misleading.

The second case was one of abortion in the eighth week with retention of a portion of placenta. Six weeks later, on a suspicion of chorionepithelioma being present, the uterus was excised. It contained a mass of dead tissue with degenerate chorionic villi and beneath this there was well preserved decidua of appearance proper to the age of the pregnancy. Clear of the placental polypus the mucous membrane was well formed but rather thin and irregular endometrium.

The certain evidence that there has been a pregnancy is the discovery of chorionic villi in the clots or adhering to the placental site. A word of warning is necessary as to the difficulty of recognizing chorionic villi. From the fourteenth day onwards arteries and veins of medium size may be found in sections in a completely fibrosed and degenerate condition at the inner surface of sections. These, especially if they are associated with a few degenerate decidua cells, may be mistaken for chorionic villi. The safest mode of deciding is to compare them with the degenerate chorionic villi which can be found in most sections of the ripe placenta.

When chorionic villi are absent, reliable evidence as to recent pregnancy can still be found in the condition of the uterus, and the surest *data* for the estimation of the period which has elapsed since its termination are, in my opinion, to be obtained from study of the stroma and glands of the decidua vera region. The condition of the large blood vessels may help in estimating the date, but this criterion is complicated by the facts that on the one hand, thrombosis followed by organization may occur ante-mortem, possibly in relation to the formation of white infarcts, and that on the other hand, great variation is seen of which I can give no explanation.

The process of involution in the blood vessels has been very fully described by Goodall. The walls both of the arteries and of the veins become enormously thickened and hyaline. In some cases a new vessel becomes established within the lumen of the old vessel. In other cases the hyaline mass remains, and, according to Goodall, whose observation I can confirm, may be recognized months or even years post-partum. Their presence is the most enduring microscopic evidence that a uterus has been at some time the seat of a pregnancy. (See Fig. 6 and 7).

Macroscopic Examination of the Uterus.

Descriptive.

In examining the gravid uterus or the uterus post-partum, the first important step is the location of the placenta. This can usually be done by external examination owing to the presence of the large utero-placental blood vessels and the feeling of greater thickness of the wall in that area. In dissecting the uterus at term, it is easy to find the utero-placental vessels under the margin of the placenta. On estimating their number, it is found that they are not very numerous and it is easy to miss them in microscopic sections through the uterine wall and attached placenta.

As mentioned above, the whole interior of the uterus after the birth becomes covered with blood clot. This is usually readily removed from the decidua vera but adheres strongly to the placental site owing to the clot being continuous with the thrombi in the torn ends of the utero-placental vessels. The site is easily located in the early stages of involution, but in the later stages it may be impossible to find it by inspection. It may, however, still be found by slicing the uterine wall, preferably after hardening, and looking for the remains of the large vessels. Ultimately, microscopic sections become the only means of recognizing it.

When the uterus empties itself it seems to contract all over, but to a higher degree at parts away from the placenta, which may be found thickened a little but not underhung at the edges.

When contraction is more pronounced, the edge of the placenta everhangs the placental site and the decidua at its margin becomes thickened and wrinkled and the fœtal membranes folded. After separation, the placenta gets crushed into a sort of rough ball and its site is very greatly contracted. In a few hours it may be reduced from six inches or more to about three inches in diameter. Then the big vessels become more apparent from being crowded together and also because they remain distended by the clots which have formed in the torn ends. At first, the site projects considerably, largely from the presence of the thrombosed vessels, and the uterine wall may be over an inch thick in this region. The site remains very obvious for at least three weeks. At fourteen days the site may measure an inch and a half in diameter and usually has a low mushroom-top shape with definite rounded margins.

In my specimen of nineteen days, where the conditions were quite normal, the site was of irregular shape and its longest diameter measured not much more than an inch. It was recognizable by the projecting ends of blood vessels, now quite small, but was itself scarcely raised above the neighbouring endometrium.

In another case twenty-five days post-partum, athough involution appeared to have been proceeding satisfactorily, the placental site was a low mushroom-top shaped area about one and a half inches in diameter and a quarter of an inch in height. In the criminal case referred to above, which was one of abortion about the end of the fourth month, and occurred four or five weeks before death, the placental site was little more than half an inch in diameter and very slightly raised.

At term the uterine tissues as well as the placenta present changes preparatory to the confinement.

The division of the decidua (Fig. 1 and 2) into three layers is still more definite than in the early stages. The decidua vera is a thick and soft membrane which is easily recognized. The superficial layer, *stratum compactum*, consists of closely packed, very large decidua cells with little or no trace of glands. The *stratum spongiosum* has become still more spongy than in the early stages, from dilatation of the glands and thinning of the inter-glandular septa. The epithelium has atrophied and disappeared and the decidua cells have degenerated to a greater or less degree. Wormser describes a layer of the *stratum spongiosum* as assuming a still more fibrous appearance owing to advanced degeneration of the decidua cells and calls it the "areolar stratum." In sections of this stained by ordinary methods the decidua cells are shrivelled or have a foamy appearance, their protoplasm being full of

vacuoles, so that the nucleus and strands of protoplasm have a spidery appearance. According to some, the vacuoles have been filled with fat. The observations are by no means clear, and it is more probable that the principal change is a hydropic degeneration of the cell. Grosser rejects the idea that there is much fatty degeneration in the decidua. My observations, so far as they go, confirm this. Eventually the spongy layer certainly comes to be very fibrous in appearance and the normal staining reactions are lost.

The plane of separation generally traverses some part of the spongy layer but the level varies. At some points the stratum compactum only may be shed, while at others, the tearing may extend to the muscular coat. Whatever is left above the areolar layer undergoes necrosis and is cast off. The areolar stratum itself continues to disintegrate. The remaining decidua cells, which are often abundant at this level, atrophy and disappear, leaving the fibrous stroma as a ragged network. It is mainly from the layer below this—the *limiting layer of His*—that the new endometrium develops.

In the earlier weeks of pregnancy, the deepest layer of the decidua retains almost unchanged the characters of the resting endometrium. There is very little development of the cells towards decidua cells and the ends of the glands are surrounded by frankly endometrial tissue or embedded in muscle and with their epithelium little altered from the normal columnar type. Later the stroma round them may look like imperfectly developed decidua.

Under the placenta in the later months there is commonly little trace of the stratum spongiosum except long slit-like gland cavities, but there may be abundance of the compact layer which is firmly adherent to the layer of dead decidua, chorionic villi and fibrin—the so-called fibrin or fibrinoid layer—which forms the base of the placenta and is shed with it. Very little decidua, therefore, may be left or the muscle may even be laid bare. It may be difficult to find glands under the placenta, but I have generally found them under the attached placenta and in the placental site in the early stages and they certainly reappear as involution proceeds. One has to remember that they have been widely separated by the enormous growth of the uterine wall and many sections may have to be examined before they are made out.

The recently bared placental site. This to the naked eye is a rugged mass of blood clots. In section it appears largely to be made up of greatly dilated veins full of red thrombus. Microscopically it is a chaotic tangle of blood vessels, remains of decidua and torn bands of muscle all infiltrated with shed blood.

The arteries appear to be closed by strong contraction and

contain very little thrombus. They are, therefore, not prominent to the naked eye. Microscopically they can be distinguished by their thick muscular walls and narrow lumen. Hyaline degeneration sets in very early. In fact it may be seen in them immediately post-partum. In the muscular wall they tend to appear in groups, an appearance which is doubtless due to the spiral course which they run. Fig. 7.

The veins superficially become extremely distended with red thrombus and stand out into the mass of blood clot. Their walls become very thin. A little deeper the red thrombus is replaced by thrombus of mixed type, the deepest parts tending to be mainly fibrinous. The veins are less distended at this level and the walls are thicker. They also become hyaline like the arteries. Below the thrombotic stratum the veins are found collapsed with irregular stellate lumina. The red thrombi are partly shed with the clots but much of them remains and gradually the red corpuscles degenerate and the whole thrombus shrinks greatly. Finally, the thrombotic vessels settle down into the uterine wall and are slowly organized. See Fig. 5.

A characteristic feature of the placental site is the presence of chorionic giant cells. These are masses of rather opaque protoplasm containing numerous nuclei. They are found principally in association with the large blood vessels and probably invaded the maternal tissue when the utero-placental vessels were established at an early stage of gestation. They vary considerably in number and state of preservation. They may be found at a considerable depth in the muscle. They are more abundant in relation to abortion and miscarriage than at term. They are *absolutely confined* to the placental area.

Muscular wall. This undergoes very rapid shrinkage. According to Sänger, the fibres shrink within the first week from an average length of about 200μ to 24μ. This is accompanied by cloudiness of the protoplasm due to the appearance of granules, some of which stain black with osmic acid. The process appears to be a combination of simple atrophy, cloudy swelling and fatty degeneration. Fat-laden phagocytes make their appearance in the connective tissue planes between the muscle and may be recognized up to about forty days post-partum. By the fourteenth day the fat has almost completely disappeared from the muscle fibres, which are beginning to have distinctly the characters of those of the non-gravid uterus. They are still abnormally large and they are also separated by an abnormal amount of connective tissue. Up to this point the condition of the muscular wall might suggest that there had been a pregnancy.

Description of the Mucous Membrane at various dates post partum. For the first fourteen days I have to rely almost entirely on Wormser as my material is scanty and not good.

Second day. According to Wormser, a division into two layers is now recognizable: (1) a superficial, which undergoes necrosis, and (2) a deep layer which is capable of resuming its function as mucous membrane. The demarcation depends on the staining of the tissues and not yet on signs of reaction:—the nuclear staining is beginning to be weak in the superficial stratum.

Fourth day. By this time the changes in detail become apparent in the decidua vera. It may still be covered with blood clots or may be in large part bare of these. The surface is composed of degenerating decidua infiltrated with leucocytes and effused blood and showing many small, thrombosed vessels. Bacteria may also be present. Below this layer the characteristic well preserved decidua is found, and in the deeper stratum many cells are seen resembling decidua cells but smaller. Their appearance suggests that already retrogression towards the endometrial type had begun.

There may be some difficulty in distinguishing blood vessels from glands. The former tend to have hyaline walls with rather prominent endothelium, and do not always contain blood. The glands superficially are wide and lined with epithelium, which may be swollen and irregular or very thin and like endothelium. Often they contain red blood corpuscles, leucocytes and fibrin. There are distinct suggestions of proliferation of the epithelium in the way of slight heaping up of the cells and changes in their form . Already one can recognize that there is a relationship between the line of demarcation and these wide gland spaces. The deep ends of the glands are unchanged.

Sixth day. This is represented by a number of curettings and a uterus (Case 14) from which several of Wormser's illustrations are taken. In the latter case death was due to nephritis and cardiac failure and the uterus was excised one hour after death and immediately fixed. It contained a flat blood clot split through the middle, so that about half went with the posterior and the rest with the anterior wall.

The *decidua vera* was mostly covered by this clot, which in parts was as much as 1 cm. thick, while the membrane itself was from 1 mm. to 2 mm. in thickness and very uneven. The line of demarcation was well formed and easily recognizable by the alteration in staining properties of the tissues.

In most places dead matter still adhered but at some points that which was to be discarded had already been separated. At such points the decidua which was to survive was partly covered by epithelium. There was considerable leucocytic infiltration

most marked at the line of demarcation, sometimes running into the inter-glandular septa, sometimes stopping quite sharply. The line of demarcation was definitely taking as its basis the dilated glands of the deepest layers of the stratum spongiosum. These were irregular rounded alveoli or hollows facing the dead matter. They were lined with epithelium and contained detritus, blood and leucocytes. In places the epithelium was still thin and like endothelium, but stretches of it were of cubical or even columnar form. Most of it, however, was irregular and showed clear signs of active growth, the cells being of various shapes and sizes and tending in places to be heaped up or forming multi-nucleate syncytial masses. Mitotic figures could not be found. (Compare pages 15 and 16). The "provisional wound cover" of epithelium had, therefore grown considerably. The deep ends of the glands showed no development.

The tissue between the glands was unmistakeably decidua, but the typical, large plump decidua cells were few in number, the majority of the cells being relatively small with the nucleus large in proportion to the cell body. Other cells showed indefinite outlines and stained badly. Two different processes were evidently going on, some cells were degenerating while others were reverting to the endometrial type.

Placental site—sixth day. This was covered by clot, from 3 mm. to 5 mm. thick, which was continuous with some of the thrombi. The layer of uterine wall containing the thrombosed vessels was about 5 mm. thick. The thrombi were of various sizes and in various stages of organization, the older stages being doubtless of antepartum origin. The tissue between was mostly necrotic and infiltrated with blood and leucocytes. Decidua cells and chorionic giant cells were readily recognizable and there were a few glands like those in the decidua vera. In a curetting of this date mitotic figures were found in the cells of the inter-glandular stroma immediately below the line of demarcation.

Tenth and eleventh days. The material related to these days is very abundant, but is mostly from curettings and associated with abnormal states. Accordingly, the picture varies very greatly, and the following description must be taken as an attempt to give a general picture.

Decidua Vera.

The mucous membrane is now a very thin and irregular layer, which is still essentially decidua in process of retrogression. The surface is very uneven from the presence of dead matter and also as a result of the trabecular structure of the stratum spongiosum. Decidua cells are still quite definitely present superficially.

In amount the stroma greatly exceeds the glands and is largely of the granulation tissue type. The deep ends of the glands show little change, but there is much irregular growth around their mouths. In a specimen from the eleventh day Wormser states that the surface of the decidua vera was largely free of dead matter and covered with epithelium. This was cubical in places but mostly flat and syncytial, and at some points appeared to be undermining the necrotic masses. Frequently in the inter-glandular trabeculae the boundary layer between living and dead was a little zone of badly stained decidua. If these dead parts were to separate, a very little further growth of the epithelium would close the gap completely. The mouths of the glands with their spreading epithelium now clearly indicated the line of demarcation between the viable tissue and the dead. The stroma, both under the necrotic tissue and under the epithelium, showed signs of active growth. In particular, he noted a general development of somewhat large stroma cells, the nuclei of many of which were in process of mitotic division. At the tenth day, therefore, the cleansing was still far from complete, but repair was progressing rapidly. In his summary he refers to the great differences even in one and the same uterus, so that in eight to ten days one stretch of mucous membrane had been "completely regenerated," while the next might be covered with dead material. The "completely regenerated" is, however, clearly not a real reconstitution of endometrium, but rather the formation of a provisional mucous membrane.

Placental site—tenth day. The thombi show little signs of organization except round the edges. The walls of the blood vessels have become very thick and hyaline. Decidua cells and chorionic giant cells are readily found beside them.

Fourteenth day. This day may be taken to represent roughly the turning point when the decidua, in normal circumstances, finally gives place to regenerating endometrium. I have one specimen of this date from a post-mortem. (Western Infirmary, Glasgow, P.M., No. 7453).

The patient had been dying slowly from bronchiectasis ending in pneumonia. The confinement was normal and at full time. The fixation of the tissue was fairly good, but the surface of the decidua vera was lost, probably from faulty manipulation. At the placental site the uterine wall was more than one inch thick and the inner surface was very irregular on account of projecting masses of thrombosed blood vessels with deep fissures between them. There was not much necrotic matter. The thrombi were red and showed little organization. There was a certain amount of endometrial tissue between the blood vessels and in it there were no decidua cells. Some glands were recognized with endometrium-like stroma

about their deep ends and a rather indeterminate tissue superficially which suggested a change occurring from granulation-tissue to endometrium. The spreading of the epithelium from the mouths of the glands over the dead tissue could be recognized.

Wormser gives a very full account of one good specimen obtained by curetting. Portions of decidua vera and tissue from the placental site were present. In the decidua vera region parts of the surface were clear of necrotic tissue and covered with epithelium which was of nearly normal type. Other parts had necrotic matter still adhering. The glands were fairly numerous and some of them were set vertically to the surface. There was no growth of epithelium over the dead tissue. There were great differences in the structure of the membrane. Some of the cells of the tissue between the glands had assumed the character of stroma cells of the normal resting endometrium, and decidua cells were not recognizable.

In the placental site the superficial layer consisted mostly of necrotic matter in which decidua was recognizable, associated with chorionic villi. Below this the large thrombosed vessels were accompanied by well preserved remains of decidua or areolar tissue with fibrous network and comparatively few cells. There were a few giant cells and many round cells. Glands were few in number and the superficial epithelium was still very irregular.

At this stage, according to my observation, groups of pigmented cells become really prominent. These are phagocytes laden with blood pigment which has been derived from the thrombi and from the effused blood which is so abundant in all parts of the interior of the body of the uterus after parturition. Small hæmorrhages also are not infrequently found in the new mucous membrane which, like granulation-tissue, is prone to bleed easily, and the position of the groups of pigmented cells often suggested origin from such little hæmorrhages. The pigmented cells remain a striking and characteristic feature of the endometrium for many weeks thereafter.

Wormser estimates the average duration of provisional regeneration of the mucous membrane in the region of the decidua vera at two to three weeks, and refers especially to Case 43 of the seventeenth day "in which an already quite cleansed mucosa covered with somewhat flattened epithelium is seen which posseses all the characters of the definitive mucosa but still is clearly differentiable from that by the different form of the glands and surface epithelium."

He lays great stress on the importance of the irregular and syncytial type of the uterine epithelium as evidence of recent pregnancy. He regards this epithelium as a hastily developed regeneration from the damaged glandular epithelium with the

purpose of furnishing the necessary material for a provisional wound cover and replacement of completely degenerate elements. This provisional epithelium is formed a-mitotically. Whether the ultimate replacement of the epithelium is by mitosis he cannot say for want of material, but up to the fourteenth day he did not find mitosis in the provisional epithelium.

As regards the disappearance of the decidua cells, he states that in the relatively small portion which is not shed, the fully developed decidua cells degenerate and disappear, while the less developed undergo retrogression to the normal resting type, just as occurs after the menstrual swelling. This retrogression is certainly very complete by the fourteenth day.

In my opinion, however, Wormser tends to overestimate the degree of rebuilding of the endometrium at this date. In my specimen of the nineteenth day, which was obtained in particulary favourable circumstances for the study of normal involution, while there is real endometrial stroma, there is also much stroma composed of the elements concerned in the repair of tne wounds.

Nineteenth day. The specimen which corresponds to Wormser's seventeenth and nineteenth day specimens is a uterus which was removed by operation by Dr. James Hendry in the Royal Infirmary nineteen days after a normal full time confinement in the Royal Maternity Hospital, Glasgow, during which a small carcinoma of the posterior lip of the cervix had been recognized. (Ward Specimen 16554, June 8th, 1925). The uterus was at once placed in formalin (Kaiserling's solution) without being opened. Later it was opened and left in the formalin so that fixation throughout was very good.

The uterus measured $4\frac{3}{4}$ inches in length. The cervix was firm with irregular lips and narrow lumen. The cancer was recognized as a small, yellow body, extending along one side from a little above the os externum nearly to the os internum. The cavity of the body of the uterus was still considerably above the normal size, measuring $2\frac{1}{2}$ inches in length by $1\frac{3}{4}$ inches between the Fallopian tubes. The lining membrane was of reddish-brown colour and the placental site was identified by irregularities corresponding to the thrombosed utero-placental vessels. The placenta appeared to have been situated on the left side of the uterus, extending more on to the anterior than the posterior wall. The placental site had become greatly contracted and was probably flatter than it would usually appear, owing to the uterus having been partially fixed before it was opened. The longest diameter of the placental site was about one inch (2.5 c.m.). The decidua vera looked like a raw, congested surface, except near the os internum where it looked like decidua. The placental site had a

rather more mottled red and brown appearance, the brown representing dead material not yet separated.

Microscopic examination, Decidua vera region : nineteenth day : In the region of the decidua vera the mucous membrane consisted of a thin layer of tissue which was neither endometrium nor decidua. (Figure 3.) It varied considerably in thickness, but was at no point as thick as the normal endometrium. The redder areas superficially contained large numbers of young blood vessels, and the stroma towards the surface had the character of granulation tissue. Deeper it resembled that of endometrium. Glands were present and the surface was covered with epithelium. The less red showed better formed endometrium, with relatively few blood vessels, more regular epithelium and comparatively few round cells. Here and there small portions of dead material could still be seen adherent to the surface, and in some of these, shadowy decidua cells could be recognized. The glands were short and in many of them the epithelium had the normal resting character. Some of them had assumed a vertical course or a slanting course according to the plane of the section relatively to the uterus. On the surface the epithelium was very irregular and low. In some parts the cells were approaching the columnar type, but in the main this had not been assumed. Where the epithelium was irregular, the stroma immediately under it contained many leucocytes, round cells and fibroblasts. Where the epithelium was more regular, the tissue below it had definitely endometrial characters; and leucocytes, while still present, were much less numerous, and were also found migrating through the epithelium. Pigmented phagocytes were not common. It was clear, however, that the endometrium was not fully reconstituted and even the process of cleansing was not complete.

Placental site, nineteenth day. Figures 4. and 5. Corresponding to the irregularity seen with the naked eye, the section of placental site showed a slightly irregular surface. The prominences were due to the remains of the large vessels filled by thrombi. The great mass of dead matter had clearly been shed, but a considerable amount still adhered. Decidua cells were just recognizable and in a few instances giant cells also. Between the thrombosed vessels the butt ends of glands were seen. These glands possessed a regular lining of typical epithelium, but towards the surface this tended to be irregular and was, in places, heaped up into more than one layer, as described by Wormser. It had spread over the surfaces between the thrombi and had certainly spread over the surface of the smaller thrombi, but not completely over the larger ones. Migrating leucocytes were present in considerable numbers. As in the region of the decidua vera, the stroma was not endo-

metrial in character but was an immature tissue composed of spindle-cells of the fibroblast-type and oval and round cells of various types. Many pigmented cells were seen and traces of dead material were present in, as well as on, the surface of the membrane. Young blood vessels were very abundant.

The utero-placental vessels contained dense, contracted thrombus of mixed type or remains of red thrombus in which the blood had broken down and the hæmoglobin had separated. The walls of the vessels were generally closely applied to the thrombi and had become hyaline. Pigmented phagocytes were numerous in their vicinity. There was surprisingly little organization in the superficial parts of the thrombi but deeper down the vessels were all obliterated by cellular fibrous tissue.

A further stage of repair is shown in two specimens of 25 and 26 days respectively.

Twenty-fifth day, premature labour. Glasgow Royal Infirmary P. M. No. 6870. November 11th, 1911. Premature labour twenty-five days before death, the cause of which was suppuration in the neighbourhood of the left ovary with septic thrombi in the veins and pulmonary embolism. The connexions of the abscess could not be made out. The uterus appeared to be a perfectly healthy, involuting organ, even the adjacent Fallopian tube appearing to have escaped infection. I have seen an abscess of this type which proved to have resulted from suppuration in a diverticulum of the colon.

The uterus, unfortunately, was not preserved, but sections were taken traversing the placental site and extending some distance beyond it at one end. The site was large for the period and projected strongly into the cavity like the top of a mushroom. It measured 3.7 cm. across and rose about 1 cm. above the adjoining surface. At either end of the section there was a great mass of thrombosed blood vessels. These were much larger than the vessels in the middle area. The mucous membrane just clear of the placental site showed definitely the structure of endometrium. The glands were long and regular, and the surface, in spite of some maceration, was covered with epithelium. Very few leucocytes were to be seen, and the round cells, which were so prominent in the nineteen day stage, had become much reduced in number. Also, the endometrial type of cell had increased. Pigmented phagocytes were present in considerable number. In the placental site a few patches of mucous membrane could be found and they had the characters of endometrium, but the glands were short and round cells were present in considerable number in the stroma. Beside the thrombosed vessels and embedded in dense degenerate tissue there were groups of large cells which were the last remains

of decidua cells. A few chorionic giant cells were also recognized. The endometrium-like tissue was covered with epithelium which had also spread over the degenerate tissue and thrombi. At other points, however, the uterine epithelium was seen growing below the dead matter as if attempting to separate it from the living. The amount of the necrotic matter was considerable. The state of the uterus in this case, as shown by sections, presented a distinct resemblance to that in the medico-legal case referred to in the introduction, but the reconstitution of the endometrium was definitely less advanced.

Twenty-sixth day, premature labour at the seventh month, Chronic metritis. Mrs. G. aet 30, Glasgow Royal Infirmary, P.M., 11580, May 22nd, 1925. The patient suffered from a subacute nephritis which developed when she was reckoned to be four or five months pregnant. On the 26th April, she was delivered of twins. One died next day and the other a week later. The stage was reckoned to be the end of the seventh month. The nephritis became steadily worse, and she died twenty-six days later. Examination was made about ten hours after death.

The uterus was considerably above the normal size. It was soft and pale, being clearly in an advanced stage of involution. It was cut open through the anterior wall. The cavity measured $3\frac{1}{2}$ inches by $2\frac{1}{4}$ inches (say 8.75 cm. by 5.5 cm.) The endometrium was thick and very congested and *looked like decidua*. The surface appeared wet and there was a certain amount of turbid fluid in the cavity. It was stated that there had been a foul-smelling discharge during life. Microscopic examination confirmed the presence of chronic metritis. The placental site was not recognized in the fresh condition, but after hardening it became visible as a prominent area, slightly nodular from the presence of large vessels. It measured about $1\frac{1}{4}$ inches (3 cm.) in diameter, and occupied the middle of the posterior wall and fundus of the uterus. The thrombosis was very widespread, the larger vessels generally contained loose, pale thrombi and the ovarian veins also contained thrombi.

After fixation by Kaiserling's process, the lining membrane had a mottled red and yellow colour and rough surface suggestive of decidua rather than endometrium. The cervix appeared normal except that the passage seemed somewhat wide.

Microscopic examination. In the cut surface the mucous membrane away from the site was about $\frac{1}{8}$ inch (3 mm.) thick. The red areas were covered by epithelium which allowed the congestion to be seen. The yellow areas owed their colour to being covered with dead matter. Thrombi were not prominent in

the section of the placental site although they were responsible for the nodulated character to the naked eye.

Region of the Decidua Vera. This showed real endometrium, characteristic but thin. It was best developed on the anterior wall opposite the placental site, and was congested. There were well developed lymph nodes like those of the decidua in the early stages and much diffuse lymphocytic infiltration extending into the muscle and indicating chronic metritis. The glands were well formed but short, and karyokinetic figures in the epithelium were fairly numerous. About the mouths of the glands the epithelium was heaped up irregularly and had also spread out over the intervening tissue. In parts it was fairly regular. In other parts there were cubical cells next the basement membrane and lying over them were cells of various shapes and sizes and syncytial masses. In such areas there were little breaches of continuity of the epithelium, in the vicinity of which leucocytes were numerous. Elsewhere there were few leucocytes. The stroma was very oedematous but typically endometrial in the areas which were covered by epithelium. Involution, therefore, was well advanced, but had a long way to go for proper reconstitution of the endometrium.

Placental site. Here characteristic structures were large blood vessels filled by very dense contracted thrombi. There was little or no sign of organization near the surface, but deeper, (that is to say, in vessels in the muscle layer) there was advanced organization. The arteries especially were in some instances filled by fibrous tissue, the picture resembling an advanced endarteritis obliterans. Chorionic giant cells were absent. I failed to find glands in the section of the placental site. The mucous membrane was a very cellular tissue consisting of fibroblasts, fibrous stroma and round cells, many of which were lymphocytes. It was, therefore, not yet as characteristically endometrial as in the decidua vera region. This specimen is warrant for the statement that involution proceeds with remarkable steadiness in spite of the presence of grave general and some local disease.

The next two specimens represent one month post-partum, and are interesting for comparison, that of thirty-one days being probably normal, while the second of thirty-three days is definitely not normal.

Thirty-first day. Mrs. S. I am indebted for this specimen to Dr. J. Norman Cruickshank, Pathologist to the Glasgow Royal Maternity Hospital. A detailed history is not available. The patient was confined on the 3rd of October, 1925, and died on the 3rd of November, 1925, from causes not connected with the pregnancy. The uterus, which was small and well involuted, was fixed without having been opened. Thereafter, it was divided

longitudinally and the right and left portions carefully dissected open from the middle round the sides so as to expose the cavity. There was not the slightest trace of thickening to indicate the placental site, but large vessels in the cut surface revealed its position. The implantation had been in the right upper quarter of the cavity. The mucous membrane was of fawn colour and had a pitted appearance suggestive of decidua.

Microscopic examination: decidua vera. The region of the decidua vera showed thin endometrium, which appeared abnormally dense as if it had been compressed by the fixation of the uterus unopened. The surface epithelium was absent to a large extent, and this also was due to some artificial cause. Where the epithelium had survived, it was fairly regular and columnar in shape. The glands showed the characteristic columnar epithelium. They were very short but were set in more or less normal direction relatively to the surface. The stroma was clearly endometrial in type, but it contained numerous pigmented cells in groups, and there was a decided excess of lymphocytes and plasma cells. Polymorphonuclear leucocytes were not seen except within the blood vessels. The stroma varied in character, being in some parts less like endometrium through containing an excess of round cells and young blood vessels. There were many old fibrosed blood vessels, which had possibly survived from an earlier pregnancy. They were easily distinguished from the large vessels of the placental site.

Placental site. At the margin this showed well formed endometrium, but contained pigmented cells, leucocytes and plasma cells. Within the site the endometrial appearance was lost. Over the thrombosed vessels there was only a very thin fibro-cellular layer and the epithelium was absent, but this was probably an artefact. Two glands were seen. Two large vessels were filled with very red, mixed thrombus with little sign of organization. Another vessel had been obliterated by organization. Deeper in the uterine wall the vessels were collapsed showing the usual stellate remains of the lumen. It was evident that the large vessels had been covered over and enclosed and would doubtless have been recognizable for many weeks longer. The endometrium in their neighbourhood had a long way to go for reconstitution, but was fairly well restored, although thin, in other parts.

A striking contrast between this and the next uterus was the complete absence, in any of the sections from the former, of necrotic matter on the surface. The principal indications that there had been a pregnancy were the thinness and immaturity of the new endometrium, the presence of pigmented cells, and the large utero-placental vessels.

Thirty-third day. Glasgow Royal Infirmary, P.M. No. 11314. August 18th, 1925. The patient, Mrs. G. aet. 21, was confined normally on July 15th, 1925. The baby developed opthalmia neonatorum and an eruption about the anus which was regarded as indicative of syphilis. The mother who was suckling, received a dose of neo-kharsivan on 6th August, and a second on 13th August. After the second dose she became extremely ill and died on the 17th August, apparently from acute neo-kharsivan poisoning.

An autopsy was made in ignorance of the history and a second examination was made later, on behalf of the Crown, and all the organs were taken for chemical investigation. Two blocks of the uterus, one of which was supposed to be the placental site, were, however, preserved for microscopic examination.

The uterus was somewhat above the normal size. On opening it, a quantity of loose debris of yellowish colour was found in the corporeal cavity. The mucous membrane was congested. There was little fluid and it was not purulent. The placental site was recognized but, unfortunately, was not described.

The endometrium on the thirty-third day: Decidua vera region. In the region corresponding to the decidua vera, the mucous membrane was fully developed, the endometrium was considerably thinner than the normal, and the inner margin of the section was very irregular showing that on the surface there were projections with hollows between them. It was covered with epithelium at most points. The surface epithelium was columnar in places, but more commonly was cubical or even appeared as a chain of rounded cells. Syncytial masses were not found. The stroma cells were closely packed and corresponded in appearance with those of the endometrium in the resting stage of the menstrual cycle. The glands were short but typical in character. With my experience I would assert from examination of the endometrium alone that there had been a recent pregnancy.

Placental site. This (Fig. 6) was covered with dead material which was adherent to the thrombi in the mouths of the vessels. Underneath the dead layer there was well formed endometrium as described above. In parts this was covered by epithelium, and in other parts, it was ill-defined from the dead layer. Groups of pigmented cells were seen. Young blood vessels were very numerous and there was much congestion which in places had produced hæmorrhage. Some old vessels were represented by hyaline masses and there were also the remains of one of the large uterine sinuses. In the latter the thrombus was completely replaced by fibrous tissue and the vessel wall had degenerated into a thick, tortuous ring of hyaline matter. (Fig. 6).

In this case it is clear that involution had reached an advanced

stage, probably progressing normally in the decidua vera up to three days before death, when conditions may have been disturbed by the acute poisoning. The placental site was not normal, as a layer of dead material had remained adherent to it, but underneath that the changes of involution and regeneration of the membrane had reached an advanced stage. It was still possible to tell with certainty from an examination of the placental site that there had recently been a pregnancy.

Uterus at six weeks. This represents the last of the stages. Glasgow Royal Infirmary, P.M. 11216, 16th May, 1924.

In this the restoration of the mucous membrane is practically complete, but it would have been possible to recognize that the patient had been fairly recently pregnant. Two sections from another uterus at six weeks presented similar conditions.

The examination was made five hours after death. The case was regarded clinically as one of puerperal sepsis running on to a late date, but proved to be an acute miliary and broncho-pneumonic tuberculosis. The uterus appeared to have been undergoing involution normally and showed no sign of sepsis.

Mrs. H., aet. 36. Two previous normal pregnancies. Third pregnancy, also normal, was completed six weeks before death. There was some rise of temperature in the first week suggestive of slight septic infection but possibly this was due to the tuberculosis. The uterus presented the appearances of healthy completed involution, being little above the normal size and soft and of yellowish colour. It was lined by well formed endometrium which was somewhat congested, and showed slight wrinkles rather like those of early decidua. The placental site could not be identified with the naked eye but was recognized in sections.

Microscopic examination. Sections were prepared from strips of tissue extending the whole length of the posterior wall and part of the anterior wall down the middle line. Preservation was excellent. The placental site was recognized in sections of the posterior wall towards the right cornu by the presence of remains of large vessels. The lower part of the posterior wall and the anterior wall presented the characters of the non-placental region.

The endometrium, (Figs. 7 and 9) in the non-placental areas had not been restored to its full normal thickness, but otherwise was characteristic of the non-gravid uterus.

It was somewhat œdematous and the cells were rather large, suggesting the approach of menstruation. A few miliary tubercles were found. There were no large vessels, but small ones which had been obliterated by fibrosis were seen. Pigmented phagocytes were present in large numbers in places. In the region of the

placental site the endometrium was thinner and less regular, and the essential difference was the presence of a number of large, obliterated vessels filled by completely organized thrombi. No trace of giant cells could be made out. The amount of brown pigment in the superficial layers was a very striking feature. In all parts the surface epithelium had been restored and the glands were numerous and regular and more or less vertical in direction, the normal slope towards the os being restored. The muscle presented the normal characters. It would still have been possible to recognize from the state of the vessels and from the pigmentation that the patient had been recently pregnant.

The stages shown in my sections, therefore, demonstrate that at the nineteenth day, under apparently healthy conditions, restoration of the uterus to normal is incomplete, especially in the placental site. The muscle, to ordinary histological examination, is practically normal, but the endometrium is decidedly immature, showing resemblances to granulation tissue. Organization of the thrombi in the large vessels is still far from complete.

The twenty-fifth and twenty-sixth days show a great advance, the lining membrane having the character of endometrium but not yet properly reconstituted, and the placental site being still indicated by less advanced reconstitution and the presence of the the large vessels with incompletely organized thrombi. Pigmented cells are now prominent.

In the specimen at thirty-three days, the picture is complicated by adhesion of a mass of material which should have been thrown off. The mucous membrane is well restored at all points, but the pigmented cells and the presence of incompletely organized thrombosed vessels would still indicate recent pregnancy. The thirty-one day specimen shows that normally all dead matter would either have been shed or covered over for disposal by absorption.

In the specimens of the sixth week, involution may be taken to be practically complete, and this corresponds with the *data* given in Liepmann's "Handbuch," and referred to on page 6.

The endometrium has, however, not attained its normal thickness, and immaturity is shown by some irregularity of the surface and irregularity of the epithelium covering it and by areas in the stroma which show some resemblance to granulation-tissue. Pigmented phagocytes and incompletely organized thrombi are also present. Clinical records show that the mucous membrane in this condition is capable of harbouring the fertilized ovum without there having been any resumption of the menstrual cycle.

Summary and Conclusions.

Knowledge of the naked eye and microscopic appearances of the uterus at various periods post-partum, besides being necessary for the proper understanding of the process of involution in relation to obstetrics, may be of critical importance in medico-legal problems such as those of criminal abortion.

Involution is a complex process, owing to the complexity of the organ concerned. In normal circumstances and even in the presence of grave constitutional and slight local disease, it probably progresses at a fairly regular rate. The greatest disturbance of the healing process is due to the retention of some parts of the product of conception, the result of which is to cause delay.

Exact chronological *data* cannot be given, but *data* sufficiently accurate to be helpful can be given, and comparison with cases detailed in the literature may be very useful in individual cases. The most reliable information is provided by examination of the mucous membrane in the regions which were covered by the decidua vera and in the placental site. Both these areas should be examined.

The changes in the first week are chiefly concerned with demarcation of tissues which are to perish and be shed in the lochia. Retrogression of the surviving decidua and reactive proliferation are also occurring. In the second week the processes of cleansing and restoration advance rapidly and formation of a provisional mucous membrane is normally completed by about the fourteenth day. There is a striking analogy between the process and that of a wound healing by granulation in the presence of sloughs and micro-organisms.

The fourteenth day is roughly the turning point at which building up definitely exceeds retrogression. At three weeks the process of restoration is still far from complete. At five to six weeks restoration should be fairly complete, but evidence of recent pregnancy may be recognizable for a considerably longer period even in circumstances most favourable to involution. Such evidence is found in the presence of pigmented phagocytes and remains of the utero-placental vessels.

I have to tender thanks to Professor Muir, Professor Munro Kerr, Dr. James Hendry, Dr. J. Norman Cruickshank and others for the use of valuable material, and to Dr. Donald McIntyre for useful criticisms and guidance as to matters clinical.

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Description of Plates.

Fig. 1. The chorion "Ch." and stratum compactum of the decidua at term. The curved line of cells below "Ch." is the chorionic epithelium. The large spaces in the decidua are the dilated glands extending from the stratum spongiosum. × 150.

Fig. 2. The deepest layer of the decidua at term. "gl"—a gland with epithelium from which the new gland would develop. The three adjacent spaces are a gland with epithelium still recognizable and two glands from which the epithelium has disappeared. To the left below are more glands and vessels not distinguishable from one another. Above is seen a portion of the "areolar stratum." × 150.

Figs. 1 and 2 are from a case of Porro-Cæsarean section.

Fig. 3. The endometrium on the nineteenth day post-partum. The stroma has the character of granulation-tissue. The glands in the deeper part are lined with cubical epithelium. Towards the surface the irregular epithelium is seen and also some decidua cells. The surface is covered with very flat epithelium.—Glasgow Royal Infirmary, Ward Specimen 16554. × 150.

Fig. 4. The endometrium in the placental site on the nineteenth day The stroma and glands are similar to those of Fig 3, but there are numbers of cells larger than the ordinary stroma cells which are pigmented phagocytes. To the left above the gland there is a small hæmorrhage. The surface is covered with irregular cubical epithelium under which leucocytes and a few decidua cells are seen.—Glasgow Royal Infirmary, Ward Specimen 16554. × 150.

Fig. 5. Portion of Placental Site at nineteen days, showing the patch of endometrium seen in Fig. 4, and one of the large veins occupied by red thrombus in process of organization.—Glasgow Royal Infirmary, Ward Specmen 16554. × 20.

Fig. 6. The margin of the placental site at thirty-three days. Below is seen uterine wall with congested new blood vessels and the remains of the old vessels which are almost completely obliterated and converted into hyaline masses. These were the deeper vessels which did not contain much thrombus. Above and to the left is seen a group of uterine glands and some recent hæmorrhage. To the right of this are seen some gland spaces with epithelium spreading from them under a mass of dead material, which should have been cast off at an earlier period but was abnormally adherent :—Glasgow Royal Infirmary, P.M. 11314.

Fig. 7. The endometrium and underlying tissue at six weeks. In the muscle is seen a group of sections of the arteries with thick hyaline walls

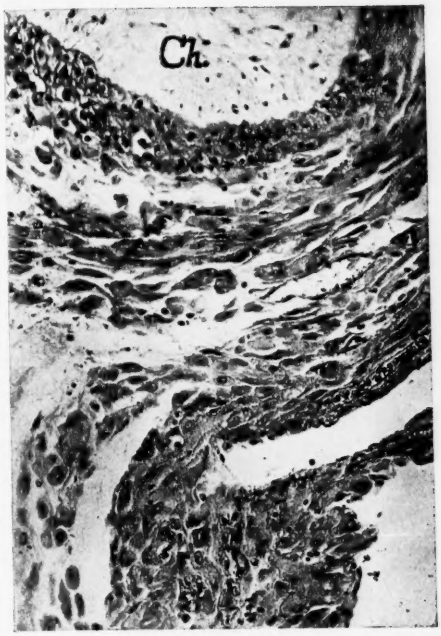

Fig. 1.

Fig. 2.

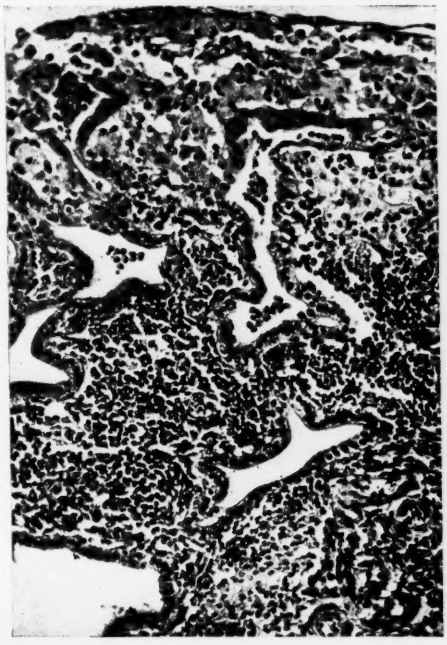

Fig. 3.

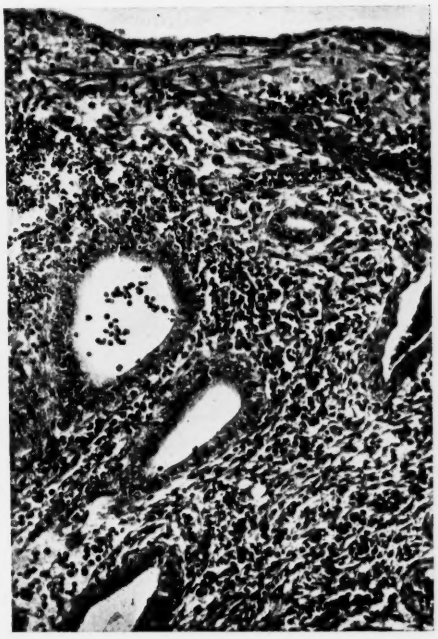

Fig. 4.

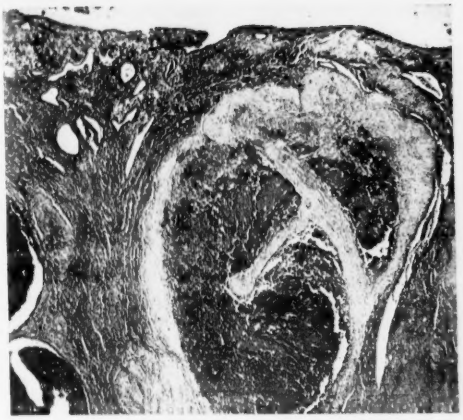

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

and with a new vessel forming in the place of the old lumen. At the junction of muscle and endometrium is another vessel which was probably a vein plugged by thrombus. Organization is far advanced. The endometrium is thin but shows glands of the normal type and is covered by cubical epithelium. A few black spots near the surface represent pigmented phagocytes. Compare Fig. 9.—Glasgow Royal Infirmary, P.M. 11216. Case. × 20.

FIG. 8. The endometrium at twenty-six days in a slightly infected case. The surface is covered by irregular stratified epithelium. In the centre is seen a fairly well formed gland and around this the tissue has the character of endometrial stroma. Deeper there is great lymphocytic infiltration which shows that there was some chronic metritis.—Glasgow Royal Infirmary, P.M. 11580. × 150.

FIG 9. The endometrium at six weeks from the same case as Fig 7. The glands are of normal type and the surface epithelium well restored. The stroma is that of the mid-period and there is no excess of inflammatory cells. There is some congestion and there are small hæmorrhages, probably due to terminal congestion.—Glasgow Royal Infirmary, P.M. 11216. × 150.

The Distribution and Significance of Ectopic Decidual Cells.

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The decidual reaction of the endometrium in cases of uterine pregnancy is well known. The decidual cells are large cells, usually ovoid in shape, with faintly granular protoplasm which contains glycogen and which is almost invariably vacuolated. The nucleus is ovoid and although large compared with the nuclei of other cells is small compared with the size of the decidual cell. Both nucleus and protoplasm stain faintly with the usual stains. Decidual cells are found in a matrix of fine fibrillæ and frequently small round cells are present in the immediate neighbourhood.

It was considered originally that the decidual cells were produced through the local stimulus of the embedded ovum, but because decidual cells are found in other situations than the endometrium in cases of uterine pregnancy and because decidual cells have been produced experimentally in animals which were not pregnant, this view can no longer be held. It is proposed in this paper to give an account of the origin and distribution of decidual cells found in cases of pregnancy, to describe other varieties of decidual cells, and lastly to discuss the theoretical significance of these phenomena. In this paper the term ectopic decidual cells will be applied to decidual cells found in the body in situations other than the endometrium.

The Decidual Cells of the Endometrium. The decidual cells which are found in the endometrium of the pregnant uterus are derived from the stroma cells of the endometrium. The proof of this statement is obtained from a comparative histological study of the resting endometrium, the premenstrual endometrium and the endometrium of the pregnant uterus. It was shown originally by Hitschmann and Adler[1] and their work has been adequately confirmed since—that in the premenstrual phase of the menstrual cycle the stroma cells of the endometrium are much hypertrophied and resemble young decidual cells. Further, at the close of the premenstrual phase they are grouped to form two layers, a superficial compact zone where the cells are packed closely to-

gether, and a deeper spongy layer where the cells surround the dilated premenstrual glands and are separated from each other because of the associated congestion and œdema. If the uterine wall of a case of early uterine pregnancy is examined, the resemblance between the late premenstrual endometrium and the decidual layer of early pregnancy is very striking. The well known compact and spongy layers of the latter closely resemble the corresponding zones of the premenstrual endometrium: the decidual cells are seen to represent more mature cells of the premenstrual stroma and the glands of Seitz correspond to the premenstrual glands. In late pregnancy the decidual cells are much more hypertrophied: in the case of the glands the epithelial lining is usually flattened.

The problem of the origin of the decidual cells of the endometrium is, therefore easily solved. It may be emphasized here that there is no abrupt transition between the swollen stroma cells of the premenstrual endometrium, the young decidual cells of early pregnancy and the mature decidual cells of late pregnancy, and that a comparative study yields the important conclusion that there is a regular unbroken development of the mature decidual cells of pregnancy from the stroma cells of the endometrium. Until the work of Hitschmann and Adler, it was considered that the decidual cell was characteristic of and peculiar to pregnancy, and the view was held that the decidual cell was produced by the local stimulus of the embedded ovum. This idea was borne out by the identification of decidual cells in the tissues surrounding ectopic gestations. But difficulties in the interpretation of this hypothesis soon became apparent.

First, in cases of ectopic gestation, decidual cells are found in the endometrium—changes which are very well marked and produced to a degree parallel with the changes in early intra-uterine pregnancy, and clinically the passage of a decidual cast is a well recognized physical sign in this condition. It is clear that this type of decidual reaction is not produced by the local stimulus of the embedded ovum. Now this well marked type of decidual reaction is only found in cases of pregnancy—either uterine or ectopic: it follows that the cause of its production must lie in some factor peculiar to pregnancy.

Secondly, the experiments of Leo Loeb[2] have shown that a decidual reaction can be obtained in the endometrium of the non-gravid uterus by means of mechanical stimuli. In the case of the rabbit ovulation takes place about nine hours after copulation, and moreover it occurs if the doe has been served by a vasectomied buck. In the latter case conception does not occur but the doe goes into the condition of pseudopregnancy. Loeb

showed that as a result of mechanical stimuli to the uterus in this state of pseudopregnancy decidual cells were produced in the endometrium, the optimum phase for decidual production being two to nine days after ovulation. Removal of the ovaries or cauterization of the corpus luteum inhibited the production of decidual cells. It follows from these experiments that the presence of the fertilized ovum is not essential for the production of decidual cells. Further, the experiments suggest that the ovaries—probably by means of the corpus luteum—are primarily responsible for the development of decidual cells, and the great value of Loeb's work was to direct attention to the ovaries as the dominant centre for decidual production.

Thirdly, in normal uterine pregnancy decidual cells are not limited to the endometrium but are found widely distributed over other areas and the distribution of these ectopic decidual cells will now be considered.

Ectopic Decidual Cells in Pregnancy. In 1897 Josefson[3] demonstrated decidual cells on the posterior surface of the gravid uterus and in 1898 Kinoshita[4] described decidual cells in the ovaries of pregnant women, these observations being confirmed by Schnell[5] and R. Meyer.[6] In 1902 Schmorl[7] discovered these cells on the pelvic peritoneum, and in the same year Lange[8] described the cells on the peritoneum of the Fallopian tubes. Subsequently, Prochownik[9] gave an account of decidual cells in the omentum, Amos[10] in the stroma of adenomyomata, Geipel[11] in the pelvic lymphatic glands and on the diaphragm, and Hirschberg[12] on the appendix. The incidence of decidual cells in other situations will be considered subsequently.

In view of this widespread ectopic distribution it must be considered that the factor controlling the decidual reaction is hormonic in its action for local stimulus of the embedded ovum is excluded by the ectopic distribution, dissemination of the factor controlling the reaction by way of the peritoneum, by the incidence of decidual cells in the pelvic lymph glands and in the subserosa of the diaphragm, and propagation of the stimulus by way of lymphatics by the incidence of decidual cells in the omentum and on the diaphragm. It is, therefore, highly probable that the exciting cause is carried by the blood stream. If these considerations are linked up with the work of Leo Loeb, it follows that the ovaries—probably by means of the corpus luteum—produce this hormone. Whether this hormone is the sole factor in producing decidual cells is a question not easily solved, but certain aspects of the distribution of decidual cells and of their arrangement in different areas are peculiar and they will now be considered in detail.

In the pregnant uterus, decidual cells are not confined to the endometrium; they can be easily demonstrated amidst the hypertrophied muscle bundles of the uterine wall and arise from the connective tissue cells of the inter-muscular septa. Their presence beneath the peritoneal coat of the uterus, originally described by Josefson, can sometimes be recognized macroscopically, for the decidual reaction may advance to such a degree in certain areas as to produce nodules which project outwards towards the peritoneal cavity. The cells are found most easily on the posterior surface low down in the neighbourhood of the pouch of Douglas. The distribution is not uniform—the decidual cells are grouped together to form either small nodules (Fig. 1), papillæ or flat areas, they are invariably subserous and the peritoneal cells are not involved in the reaction. The cells arise from the connective tissue cells of the subserous layer. In this situation they show a well marked tendency to be clustered around lymphatic channels, but again they arise from connective tissue cells and the endothelium of the lymphatic spaces although swollen does not exhibit a decidual reaction (Fig. 11). The incidence of glandular structures usually included under the term endometrioma in this region is well known and characteristically a well marked decidual reaction is found in the surrounding connective tissue cells.

In the endometrium the decidual reaction is usually limited to the endometrium of the body of the uterus. But the stroma cells of the cervix are usually swollen in pregnancy and a true decidual reaction is sometimes found. That this reaction is not typical is shown by the figures of Ballerini,[13] 25 per cent. and Gaifani,[14] 55 per cent. which give the incidence of decidual cells in the cervix at term. Apparently the stroma of the cervix does not usually respond to the ovarian hormone.

The distribution of decidual cells over the pelvic peritoneum is very widespread during pregnancy, and in the literature descriptions of cases are given in which a close resemblance to miliary tuberculosis of the peritoneum has been found. The arrangement of the cells is similar to that found on the surface of the uterus—the nodular type being the most frequent.

The production of decidual cells in the ovary is very constant during pregnancy. This applies both to uterine and to extra uterine gestations. I have succeeded in demonstrating decidual cells in 20 cases of either uterine or extra-uterine gestation in which the ovaries have been examined. In early cases of tubal gestation the cells are small, but in those of normal pregnancy at term they reach a size equal to that of the decidual cells of the endometrium. The arrangement of the cells is either in the form of groups, causing small nodules to project on the surface of the

the ovary or as flat areas. In both cases the cells are found in the albuginea immediately beneath the cortical epithelium. Rarely the cells are found deep in the cortical stroma and Kehrer[15] has reported a case in which decidual cells were found in the connective tissue part of the wall of a corpus luteum cyst. The cells are always most painful in the neighbourhood of the corpus luteum. Again, in the ovary, as in the case of the pelvic peritoneum, a decidual reaction is well marked around the glandular structures so frequently found beneath the cortical epithelium (Fig. III).

In the Fallopian tube in cases of uterine pregnancy the decidual reaction resembles that found in the subperitoneal tissues of the pelvis (Lange[8]). In cases of ectopic gestation decidual reaction in the Fallopian tubes is not so common as is generally supposed. Lange[8] gives the incidence of decidual changes in the tubes as 10 per cent. in uterine pregnancy, and 40 per cent. in tubal gestation. Of the 18 cases of tubal gestation which I have investigated, in five, *i.e.* approximately 28 per cent., a true decidual reaction could be demonstrated in the Fallopian tube, although in all 18 cases there was well marked hypertrophy of the connective tissue cells in the wall of the Fallopian tubes. Of the five cases, decidual changes were found in the plicae in one case, in the subserous tissues in two cases, and between the muscle layer and plicae in two cases. In the other 13 cases swollen connective tissue cells were found in the plicae in three cases between the plicae and the muscle wall of the tube in ten cases, and in the subserous tissues in seven cases.

Although a certain resemblance existed between these cells and true decidual cells, they were not classed as such because of the absence of the intercellular fibrillæ and of the small round cells which are invariably associated with decidual cells. Further there was no suggestion of grouping together which is typical of ectopic decidual cells. These cells can be explained by assuming a simple hypertrophy of cells in the neighbourhood of the actively growing ovum. But the distribution and the incidence of the decidual cells of the Fallopian tube are peculiar. There is no suggestion that they are produced by the local stimulus of the ovum. On the other hand there is a suggestion that only certain cells can respond to the stimulus producing decidual reaction. This point will be considered in detail later. There is one feature about the histology of ectopic gestation that is not usually mentioned and which may be conveniently indicated here. It is often extremely difficult to differentiate between decidual cells and the cells of Langhans' layer in tubal gestation. There is a close similarity between the two types of cell and the rule of round cells and intercellular fibrillæ accompanying decidual cells must

be rigorously applied before the differentiation can be made. The modern view of the etiology of ectopic gestation assumes early and vigorous development of the trophoblast as contrasted with cases of placenta praevia in which late development is held to occur. In cases of ectopic gestation the proliferation of Langhans' cells bears out this theory.

Decidual cells have been described in the omentum particularly by Geipel[11] and they can be fairly easily demonstrated. They show the usual characteristics lying beneath the peritoneum, clustered together to form groups lying in a fibrillar matrix and associated with small round cells. (Fig. IV). The decidual cells which are found in the omentum are large, and giant cells 80—100μ in diameter with as many as 10—12 nuclei have been recorded (Geipel), It is rare to find the cells grouped to form nodules which project on the surface of the omentum. This arrangement, seen on the surface of the uterus and the pelvic peritoneum is also met with on the peritoneum of both anterior and posterior abdominal walls and here again the decidual cells lie beneath the peritoneal endothelium, the decidual reaction not involving the endothelial cells (Fig. V). In the case of the omentum and also of the peritoneum the decidual reaction is seen best inferiorly near the pelvis. There is no record of decidual cells being found in the lesser omentum, and while it is easy to demonstrate decidual cells beneath the peritoneum in the pelvis, above the umbilicus the search becomes more difficult. Nevertheless decidual cells have been found on the inferior surface of the diaphragm (Geipel). I have confirmed this observation but in this situation few cells are present.

Geipel has carried out some very painstaking investigations on the distribution of ectopic decidual cells in cases of uterine pregnancy and has described decidual cells in addition to the situations indicated above, in the ligamentum rotundum, in the ilio-psoas muscle and in the pelvic lymphatic glands. This last observation is of some importance. Positive results were obtained in 13 out of 34 cases which were investigated. The decidual cells were found in the sacral, the hypogastric and the promontory groups. The cells were distributed at the periphery of the gland involving the cells in the region of the peripheral lymphatic sinus. The importance of the incidence in these glands is that it offers a parallel to glandular structures resembling the endometrium which are found in the same situations, which were described in detail by Brunet[16] in 1905, although Wertheim had seen them when working on the glandular involvement in cases of carcinoma of the cervix. R. Meyer considers these glandular structures to be a result of an inflammatory process and recently Halban[17] has considered them in

detail in his paper on endometrioma. Geipel is to be envied on the wealth of his material. I have not succeeded in demonstrating true decidual cells in lymphatic glands but I have found that the cells in the situations he indicates are swollen. However, both his descriptions and plates are convincing and I do not doubt that decidual cells occur in these situations.

There are some other interesting points about the distribution of ectopic decidual cells. Decidual changes in the stroma of adenomyomata were described by Amos[10] in 1905 and in the recent literature accounts of the changes in chocolate cysts of the ovary have been given. As indicated above, they are readily identified around the glandular structures so frequently found in the ovary and in the pouch of Douglas and which are usually included under the term endometrioma. On the other hand, they are rarely, if ever, found in the vagina—in Freund's case they were found in the wall of a vaginal cyst. There is no accurate description of decidual cells being found above the diaphragm. Reports of the discovery of decidual cells in the neck and in the pelvic vessels are not convincing.

The significance of decidual cell production may now be reviewed. The incidence of the decidual cast in ectopic gestation, the distribution of decidual cells in ectopic gestation and the ectopic arrangement of decidual cells in normal pregnancy, all are factors which together prove that decidual production is not the result of the local stimulus of the embedded ovum. Secondly, the ectopic distribution and the peculiar arrangement of decidual cells suggest that the production of the latter is controlled by a hormone circulating in the blood. Thirdly, the source of the hormone is the ovaries and not the ovum itself. This is proved by Loeb's experiments and by the incidence of decidual cells in the premenstrual endometrium as was shown originally by Hitschmann and Adler. Fourthly, the experiments of Loeb in which the corpus luteum was destroyed, and the recent work which suggests that the corpus luteum controls the production of the premenstrual change in the endometrium—the decidual changes in the stroma and the crenated hypertrophied glands—indicates that the factor controlling decidual changes is produced in the corpus luteum. This theory accounts for all the known facts relating to decidual production—in pregnancy the corpus luteum persists until the puerperium when both it and decidual cells disappear and in the premenstrual phase a mature corpus luteum is present in the ovaries. The production of the decidual cast in ectopic gestation is also explained on this theory. The question of whether the corpus luteum hormone is the sole factor will be considered subsequently.

According to this theory, if the mature corpus luteum of the menstrual cycle produces the decidual change in the premenstrual stroma and if in pregnancy the corpus luteum produces the decidual reaction in the endometrium, it is clear that a parallel exists between the two cases. Theoretically, then, as ectopic decidual cells are produced during uterine pregnancy so should ectopic decidual cells be found in the premenstrual phase of the menstrual cycle. As a corollary, one would not expect to find decidual changes either in the post menstrual or early interval phases, times when there is no young or mature corpus luteum in the ovaries.

The only work on the incidence of ectopic decidual cells in patients who were not pregnant is that of Schiller,[18] but as a large amount of accurate material was available, I resolved to put this hypothesis to the test. The material consisted of ovaries which had been removed at operation from patients with known menstrual histories. The problem resolved itself into the search for decidual cells in the histological preparations from these ovaries. Needless to say, in no case was there suggestion or evidence of pregnancy. It was found that either van Gieson's or Twort's stain was the most suitable—hæmatoxylin and eosin preparations were unsatisfactory. It was at once observed that the ovarian stroma differed very markedly at the various phases of the cycle and that when a mature corpus luteum was present the stroma was hyperæmic and œdematous and, most important from the aspect of the investigation, the stroma cells were swollen. Almost invariably the stroma cells were found to be swollen between the 20th and 28th days of the cycle. It was not considered that this hypertrophy was evidence of decidual reaction; only those cases in which the classical characters of decidual formation, *viz.*, decidual cells together with round cells in a fibrillar matrix were present, were included under the heading of positive findings.

In all, 50 cases were investigated but in only 33 were accurately timed ovaries of patients with regular menstrual cycles available. The remaining 17 showed parallel characters, but in view of the unreliable nature of the menstrual histories they will not be considered here.

Of the 33 cases, in eight (Group A) decidual changes were found, in 14 (Group B) swollen stroma cells alone were found, and in 11 (Group C) no decidual cells and no swollen stroma cells were present.

Group A. Eight cases. In all cases decidual cells were found in the ovaries. The decidual cells were distributed in the same fashion as is met with in ectopic decidua associated with pregnancy, bunched together in clumps in the ovarian cortex immediately

beneath the surface epithelium (Fig. VI). In the cases from which the photograph was taken the cells were large, larger than the decidual cells of the endometrium of the Teacher Bryce ovum No. 2 (Fig. VII). It was found that the cells were most numerous in the region of the corpus luteum (Fig. VIII). The relationship of the cases to the phase of the menstrual cycle was as follows—the first day of the period of bleeding being taken as the first day of the cycle:—18:27:27:28:1:1:3:5. That is to say three corresponded to the late premenstrual phase; four with the period of bleeding and one with the early premenstrual phase.

Group B. 14 cases. In no case were decidual cells found but in all cases the ovarian stroma was oedematous and some of the stroma cells swollen—particularly the cells in the neighbourhood of the corpus luteum. But these cells were not grouped as decidual cells for the reasons indicated above. These cases corresponded to the menstrual cycle as follows:— 17:18:18:18:19:20:23:23. 24:25:26:27:28:1. The hyperæmia and activity of the ovary at this phase of the cycle is thereby indicated.

Group C. 11 cases. In these cases no decidual cells and no swollen stroma cells were found. These cases correspond to the 28 days cycle as follows:— 1:1:4:7:7:8:9:11:11:14:20. The majority, therefore, correspond to the postmenstrual and interval phases.

If these figures are further analysed it is seen that of 19 cases corresponding to the interval between ovulation—at the 14th day—and the onset of menstruation, in four, *i.e.* in 21 per cent., decidual cells were found in the ovaries, or, if the period of bleeding is included, in eight of 27 cases, *i.e.* approximately 30 per cent., decidual cells were found. The negative results are also of importance, for in no case corresponding to the postmenstrual phase—when no young or mature corpus luteum is found in the ovaries—were decidual cells found, although it is true that only six such cases were available.

These investigations, therefore, afford additional evidence that decidual production is controlled by the corpus luteum. Further, in all cases of Group A the decidual cells were most numerous in the neighbourhood of the corpus luteum. One case included in Group A is of importance for decidual reaction was found in the stroma surrounding a glandular structure of the type usually included under the term endometrioma. This observation has not, I believe, been previously recorded. (Fig. IX.).

Discussion.

If the theory that has been put forward in this paper is now considered in detail it will be seen that there is very strong evidence to support the contention that decidual reaction is controlled by the corpus luteum. There is no evidence to show that decidual production occurs independently of the presence of a corpus luteum in the ovaries—apart from a few isolated experiments of Loeb which can perhaps be explained in some other way. Further, the evidence from the histological side is in support of the view that the corpus luteum exerts its influence by means of a hormone circulating in the blood stream. It is at this point that grave difficulties arise. In the first place, on this hypothesis decidual reaction should be spread diffusely through all the organs of the body, yet there is no reliable evidence to show that decidual cells are found above the diaphragm. Again decidual reaction is well marked in particular areas, for example, the endometrium in cases of ectopic gestation, the pouch of Douglas and in endometriomata and this selective distribution cannot be explained unless some further stimulus is postulated. From the purely experimental side Loeb came to a similar conclusion and suggested that the corpus luteum sensitized the endometrium for decidual production, but that an additional stimulus was necessary either in the form of the fertilized ovum or as a local mechanical stimulus. This view of Loeb is incomplete with our present knowledge: its value is that it indicates clearly that in decidual production the corpus luteum is not the sole factor. R. Meyer confirms this view and has pointed out that an ectopic decidual reaction is best displayed in the region of areas of inflammation. Meyer affords this inflammatory factor the *rôle* of the additional stimulus. That this explanation is unsatisfactory is shown by the occurrence of ectopic decidual cells in situations where no inflammatory changes can be found. For example, in no case of Group A was there any suggestion of inflammatory changes. At this point one may digress a little. It is by no means clear what the function of the decidual cells may be. It is usually stated—somewhat bleakly— that they help in the nourishing of the young ovum. On purely physiological grounds it is difficult to believe that this is their sole function. It is extremely probable that ectopic decidual cells are produced for some purpose. One cannot believe that such collections of cells represent the prodigality of the corpus luteum in the secretion of this particular hormone. Again, why is it that with ectopic decidual cells the distribution is so irregular? For example, while some cells in the pouch of Douglas respond, cells immediately adjacent in similar anatomical relations are unaffected.

It is as the result of these considerations that one is forced to conclude that although the corpus luteum factor is hormonic in its influence, yet only certain cells are capable of responding to this hormone. It is, therefore, suggested that the property of decidual reaction is inherent in certain of the cells which are derived from the subcoelomic mesoblast.

This explanation is obviously both primitive and unsatisfactory, and is not in keeping with the canons of morbid histology. But there is indirectly some evidence in favour of it, and the evidence is obtained from a consideration of the distribution of endometriomata. It is clear that there is a very well marked resemblance between the distribution of ectopic decidual cells and endometriomata—in the ovaries and in the pelvic lymphatic glands this is very striking, so much so that it is difficult to believe that some relation does not exist between them. And so one is turned again to the question of the ætiology of endometriomata. Sampson's theory offers no explanation of the resemblance between the distribution of ectopic decidual cells and endometriomata and those of us who do not accept his theoretical considerations and take an agnostic view of the evidence he adduces in support of his theory, but incline rather to the view of R. Meyer and of Schiller, cannot express any dissatisfaction. On the other hand, a parallel is at once evident between the recent views of Schiller[19] and the view expressed in this paper.

Conclusions.

1. Ectopic decidual cells are widely distributed in normal uterine pregnancy.
2. Decidual cells are also found independently of pregnancy in the premenstrual phase of the menstrual cycle. They can be be demonstrated both in the endometrium and in the ovary.
3. Decidual production is controlled by the corpus luteum through a hormone circulating in the blood: but a further factor must be stipulated to explain its peculiar distribution. It is probable that only certain cells can respond to the corpus luteum hormone and that under the influence of the corpus luteum they become decidual cells.

I have to thank Prof. Teacher for the specimen from which Fig. VII was obtained.

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

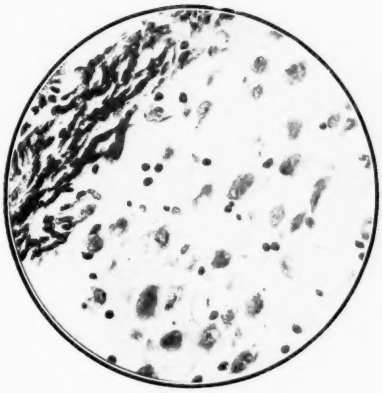

Fig. 6.

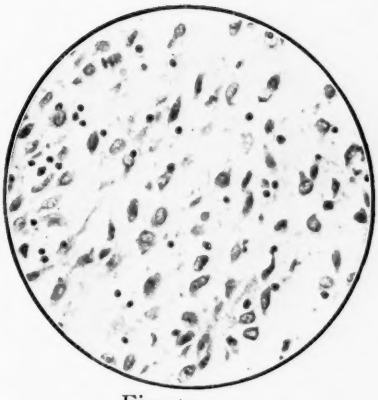

Fig. 7.

Fig. 8.

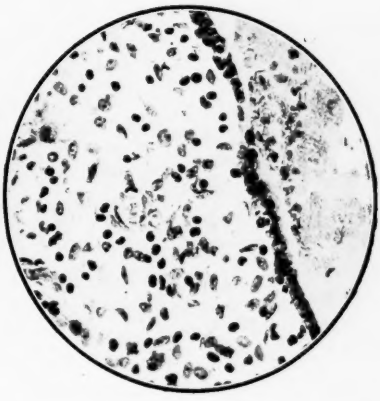

Fig. 9.

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LEGENDS.

FIG. 1. Nodule of decidual cells on posterior surface of pregnant uterus at term. ... ...

FIG. 2. Collection of decidual cells around a lymphatic space From subperitoneal tissues of the pouch of Douglas. Pregnancy at term.

FIG. 3. Decidual cells around a glandular space in the cortex of the ovary. From a case of pregnancy at term.

FIG. 4. Decidual cells in the omentum. Pregnancy at term.

FIG. 5. Nodule of decidual cells beneath endothelium of peritoneum of anterior abdominal wall. Pregnancy at term.

FIG. 6. Decidual cells in cortex of ovary. Ovary at 28th day of menstrual cycle.

FIG. 7. Decidual cells of endomentrium of case of Teacher Bryce Ovum No. 2. Same magnification as in Fig. 6.

FIG. 8. Decidual cells in ovary of same case as Fig. 6. Relation of cells to corpus luteum is shown.

FIG. 9. Endometrioma of ovary decidual reaction during premenstrual phase.

The Pathology of Fœtal Maceration.

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Introduction.

The present research is based upon the examination of 27 macerated fœtuses of viable age, occurring in a series of over 100 cases of still-birth and neo-natal death investigated by the writer; and the following paper comprises three sections; firstly, a brief resumé of work already done in this field; secondly, a description of the naked eye and microscopical changes occurring in maceration; and thirdly, a consideration of the nature of this process.

PART I.

A. Historical.

At the British Medical Association Congress in Glasgow, in 1922, the late Dr. J. W. Ballantyne, in his address to the Obstetrical Section, laid it down as an axiom, that the study of fœtal maceration is the common basis of the whole pathology of ante-natal death. This well-known authority also stressed the fact that only as the changes peculiar to maceration *per se* are recognized and sifted out from the alterations due to co-existing disease, will further progress in this field of research be possible. He pointed out, in addition, that the investigation of the process of maceration not only throws light on the diagnosis of pre-natal disease, but also extends our knowledge of the nature of autolytic processes occurring in an aseptic medium.

The earliest researches upon this subject were not, however, made from the standpoint of any of the above lines of investigation, but were undertaken in the field of forensic medicine, with a view to elucidating the difference between maceration *in utero*, and prolonged immersion in water; and also the contrast between intra-uterine autolytic changes, and ordinary post-natal tissue alterations in cases of infanticide.

One of the first workers on this subject was the well-known medico-legal expert, M. Orfila[1], who, in 1828, recorded a number of interesting observations upon the changes occurring in the bodies of stillborn children exposed at varying temperatures in

different media, such as atmospheric air, gases, stagnant and running water.

These carefully controlled experiments proved conclusively that different parts of the body do not disintegrate with equal rapidity, and that decomposition takes place more rapidly in running than in stagnant water. It is of interest to note, in this connexion, that the liquor amnii surrounding a dead fœtus *in utero*, is, in the light of our present knowledge, practically a stagnant fluid.

Orfila's work was followed in 1867, by the publication, in Paris, of Lempereur's[2] classic thesis on the pathological consequences of pre-natal death in all its stages. This work, which is probably the most valuable and comprehensive monograph extant on the subject, covers the whole range of post-mortem changes occurring in the embryo and fœtus from early pregnancy until the end of gestation, and includes observations on absorption, mummification, putrefaction and maceration. The writer deals specially with the latter, and endeavours arbitrarily to fix limits as to the length of time during which a fœtus must have been retained *in utero*. This "period classification" of cases of maceration is quoted by Ballantyne[3], and is the standard which has been adopted for the present series.

Lempereur also specially stresses the universality of fatty degeneration of organic elements in each degree of maceration, summing up the process in his expressive phrase, "fat appears in the child at all stages of its regressive march." Although this point will be referred to later, it may be mentioned in passing, that investigators are by no means unanimous as to the occurrence of fatty degeneration in such cases.

The next medico-legal contribution of importance was a paper published by L. Sentex[4], in 1869. This was an able attempt to describe the variations seen at different periods of maceration, and to differentiate such naked-eye appearances from those occurring during post-natal immersion. According to Sentex, these changes are easily distinguishable, since the corpse of a fresh still-born fœtus is found to undergo practically the same alterations in water as the body of an adult. This observer was also the first to point out the importance of the rose colouration of the structures of the eye as a pathognomonic sign of fœtal maceration. The researches of Sentex were based, however, only upon the personal examination of a series of 11 fœtuses, and with such limited material it was impossible to make adequate allowance for pathological changes due to concomitant disease, or for other modifying conditions.

In 1880 a further contribution to the subject was made by O. Hourlier[5], in a thesis presented to the University of Paris.

Hourlier, although writing primarily from an obstetrical point of view, paid special attention to the differences which exist between maceration in liquor amnii, and immersion in water, pointing out that in the latter, a hard œdema, or species of sclerema, is produced by imbibition, and that the colour of the skin is pale, not rose. He also drew attention to the fact that sero-sanguineous effusion does not ordinarily occur in the body-cavities subsequent to immersion, and that the umbilical cord, although trebling its volume, remains pearly-white.

Little or nothing has been added by British medical jurists to the masterly descriptions of these Continental observers, the writers of English text-books contenting themselves, as a rule, with merely a brief note as to the general external appearances visible in maceration.

The subject is also almost invariably conspicuous by its absence from modern text-books of pathology, although adequate descriptions are given of the appearances visible in ordinary post-mortem autolysis.

In the field of midwifery, however, the question of fœtal maceration has been viewed from various standpoints, such as the diagnosis of death *in utero*, its effect upon the mother, and its bearing upon the mechanism of labour. It is interesting to note in this connexion, that the diagnosis of fœtal death can now be made by X-ray demonstration of the overlapping of the cranial bones and shrinkage of the skull-contents which take place during maceration. (Spalding.[6]) Valuable observations have also been made by Boissard[7] upon the changes which can be noticed on palpating the maternal abdomen in cases of fœtal death.

Strachan[8], contributed to the British Medical Journal in 1922, a study of 24 cases of fœtal maceration, this being part of a report to the Medical Research Council on "The Ætiology and Pathology of Stillbirth."

A considerable amount of work has also been carried out upon placentæ retained *in utero* after the death of the fœtus.

The chief British investigator in this department has been Eden[9], who, in 1896, published an important paper on "The Structure of the Ripe Placenta, and the changes which occur in placentæ retained *in utero* after the death of the fœtus." In this paper, Eden criticizes the assertion previously made by Fothergill, that the deposited fibrin in the functionless placenta becomes organized into connective tissue, and denies the possibility of vascularisation occurring under such conditions. Controversy still prevails, however, as to whether the fœtal portions of the placenta can manifest vital changes such as budding, subsequent to the death of the child, the bulk of opinion being against this view.

One of the latest contributions to this branch of the subject occurs in the Report upon Stillbirths, presented to the Ministry of Health in 1922, by Holland.[10] In the section upon fœtal adnexa, Holland states that in most macerated placentæ there occurs excessive hyaline degeneration of the stroma, collapse of blood-vessels, and overgrowth of the chorionic epithelium in the form of densely nucleated masses. The last mentioned change, however, is not necessarily typical of the macerated organ, as the present writer has not infrequently found it in the placentæ of normal fresh fœtuses.

Considering, in the last place, the contributions made to the subject of maceration, by physiologists, we find a number of researches recorded upon the experimental autolysis of tissues *in vitro*, and to these, more detailed reference will be made in Part III, which deals with the nature of fœtal maceration.

Mention may be made in passing, however, of the work of Cruickshank[11], of Mendel and Leavenworth[12], and of Lane-Claypon and Schryver[13].

It will thus be seen that while a considerable amount of work has already been done, further investigation of a much larger number of cases is urgently required, especially with a view to elucidating the part played by various modifying factors upon the processes of fœtal autolysis.

B. Scope of the Present Investigation.

The aim of this study is to trace, as far as possible, the pathological changes which occur in maceration *per se*, and to this end it has been necessary to eliminate from the subsequent descriptions, any modifications known to be due to antecedent or coincident disease or trauma, such as, for example, the small visceral ecchymoses which almost invariably occur in cases of fœtal asphyxia.

Such elimination has generally been feasible in every case, after due consideration of the clinical history of the mother, the type of labour, and when possible, the maternal Wassermann reaction, and gonorrhœal-complement-fixation test.

The post-mortem examinations, and the various details of the histological work were personally carried out: and all statements made in Part II, both with reference to normal and macerated fœtuses, are based upon specimens personally examined.

A special effort has been made to trace the consecutive changes occurring in each of the important viscera in the three stages of maceration, as, with the exception of three or four organs briefly mentioned by Lempereur, this has not been done by any of the writers whose work has been consulted during the present investigation.

The cases examined have been divided into three groups, according to the degree of maceration present, and the general standard adopted is that of Lempereur.

The first group comprises cases retained *in utero* from one to ten days. Nine of these occurred in the series, and may be considered instances of "slight maceration." Some of such cases are occasionally difficult to distinguish, pathologically, from instances of early neo-natal death showing commencing post-mortem changes. In the latter, however, green discolouration of the abdomen, ballooning of the intestines, floating of the lungs in water (unless consolidation be present), the condition of the stump of the umbilical cord, the possible presence of food in the stomach, and the change in the colour of the intestinal contents, suffice in general for differentiation.

The second group includes fœtuses retained *in utero* from 10—40 days, and is much the largest, comprising 15 cases.

The third group, a very small one, consists of cases retained for over 40 days and comprises only three specimens, such a length of retention being very unusual.

In relegating the fœtuses to these various groups, it was obviously desirable to find out as accurately as possible, the date of the ante-natal death. Unfortunately, however, this was rarely feasible, since the only scientific proof of the exact date of cessation of intra-uterine life in the later months of gestation, is the absence of fœtal heart-sounds once these have been definitely heard, and such regular auscultation is seldom performed.

We are thus driven back upon the recognition of (a) subjective symptoms, on the part of the mother, and of (b) objective signs, on the part of the attendant, in order approximately to determine the date of death.

Such subjective maternal symptoms are generally vague, and have been variously described in the text-books, as, for example, general indisposition, a feeling of weight in the abdomen, fœtor of the breath, brown vaginal discharge, and cessation of fœtal movements. The last two mentioned are the most suspicious, cessation of movements being the symptom most frequently mentioned. In three of the cases occurring in the present series, the mothers were definitely able to state the date on which "life" ceased to be felt, the periods which ensued before delivery being ten days, five weeks, and two months, respectively. In each instance, the stated period agreed approximately with the degree of maceration present. In two other cases, however, the maternal statements were found unreliable, one mother, a primipara, stating that she had felt movements two days prior to the delivery of an extremely macerated fœtus! In a number of instances, the

mothers either did not know that intra-uterine death had taken place, or were unable to state when this had occurred. It will thus be seen that in the absence of continuous supervision of the pregnant woman, it is impossible to state with accuracy, the exact length of time during which a dead child has been retained. Even with such supervision, cases of twins in which one fœtus dies *in utero*, while the other survives, present almost insuperable difficulties in the ante-natal diagnosis of death. Three instances of such occurred in the present series.

PART II.

A. Appearance of the Fœtus and Placenta in the Various Stages of Maceration.

Stage I. (1-10 days after death.)

If expelled within a day or so after its death, the fœtus shows little or no recognizable alteration in appearance. Ordinary post-mortem staining may be found on examination of the body, and this condition was well marked in one of the specimens examined.

Early in this first stage, however, undue flaccidity of the trunk and limbs becomes manifest, and signs of commencing separation of the epidermis make their appearance. The first evidence of the latter consists of a mere wrinkling of the surface, when the finger is lightly passed over the small area of skin primarily involved. This preliminary epidermal separation may begin on any part of the trunk or limbs, but never on the scalp or face. It is rapidly followed by the formation of bullæ, filled at first with clear serum, which frequently are ruptured during delivery or subsequent handling. These bullæ generally occur first on the arms and legs, and especially on the latter, but are never seen on the palms or soles. The rosy tint of the skin, which is frequently observed during this stage, is merely the normal colour of the average healthy fœtus, and must not be confused with the brick-red hue which ensues in the later stages, as a result of the universal diffusion of hæmoglobin throughout the tissues.

Even during this early period of retention, some œdema of the scalp is present, together with a caput succedaneum of varying size, consisting of gelatinous material which is at first of a clear yellow tinge, but later becomes blood-stained. Occasionally, however, this caput consists merely of blood-stained fluid, which gushes out on incision of the tissues. The pericranium is only loosely adherent to the bones of the vault, and the sutures show commencing solution. The tongue is often pale, and the mouth open. Oedema of the eyelids is frequently present, while towards the end of this stage, the contents of the bullæ on the skin have become sero-sanguineous,

and blood-stained fluid may be seen issuing from the mouth and nose.

The anal sphincter is relaxed, and meconium is often visible, even in vertex cases.

The scrotum in the male, and labia majora in the female, show distinct œdema, the former, as a rule, being distended with blood-stained serum, whether the presentation is a breech or not.

When the skull is opened, the membranes are sometimes found to be œdematous, but the brain tissue is still fairly firm, and of the normal whitish tinge.

In the pleural, pericardial, and peritoneal cavities, a small amount of clear yellow serum, which rapidly becomes blood-stained, is invariably present.

During the first days after death, there is no difficulty, as a rule, in distinguishing this normal effusion from the larger quantity found in cases of syphilis, or general œdema of the fœtus. Its colour is also paler than the brilliant canary hue which is present in some cases of syphilis.

The important viscera tend to be slightly softer than usual, this flabbiness being especially noticeable in the heart.

Cartilage still retains its glistening white appearance, but, in the neighbourhood of the epiphyseal lines, a pink tinge is already becoming visible.

The centres of ossification are still of a deep red colour, and the periosteum is easily stripped off the bone, except at the epiphyseal line, where it is normally adherent. When a long bone, such as the femur, is sectioned, however, separation of the diaphysis from the epiphysis very commonly occurs.

The urine is at first clear, then may become blood-stained.

Hæmolysis of red corpuscles occurs early, hence the impossibility of testing the Wassermann reaction even in the first stage of maceration.

Stage II. (10—40 days after death).

Owing to the wide time-limit in this group, the changes observed are very varied in degree. A curious, heavy, and quite pathognomonic odour, entirely different from that of putrefaction, is now evident.

Limpness of the body is so marked that its various parts may be twisted into any attitude, however grotesque. The general colour of the skin is now a bright lobster-red, although over the abdomen it is occasionally dark crimson or bluish in tinge. The latter condition is generally present when the peritoneal effusion has become very deep in colour.

The epidermis is peeling off the trunk and limbs in large sheets, very few intact bullæ being visible. That of the palms and soles

is intact, however, and the nails are still *in situ*. The mouth is widely open, and the anus and the vagina gape markedly. The scrotum is distended with a dark effusion which is sometimes gelatinous.

The scalp is now dark crimson, and presents marked variations in laxness. Early in this period, undue mobility of the cranial bones is found, while, later on, the scalp shows much "sagging," forming a species of bag in which the bones lie completely separated, their edges showing well-marked serrations.

As has been previously mentioned, this overlapping of the cranial bones, when recognized by the X-rays, is now considered to be definite evidence of intra-uterine death.

During this period, the features are still recognizable, and blood-stained serum exudes copiously from nose and mouth. The conjunctiva is œdematous, the external coat of the eye having assumed a deep pink hue. The lips, tongue, and buccal mucosa are of a uniform reddish-fawn.

The subcutaneous tissues are now infiltrated with a gelatinous blood-stained effusion, which is most marked in the dependent parts of the body, being massed between the skin and the muscles. The latter are markedly softened and often very dark in colour, their fibres being separated by œdema.

Before complete solution of the cranial sutures takes place, a large extra-pericranial red gelatinous clot is almost invariably found, and the layers of the scalp are individually unrecognizable. The brain is of the normal colour at the beginning of this stage, but rapidly assumes a pinkish tinge. At first, it maintains its shape *in situ*, but collapses when removed. Before being disturbed from its position, the convolutions are still quite visible, and the Rolandic and Sylvian fissures well-marked. Later on, however, the organ becomes more and more deliquescent, until, towards the end of this period, it forms a mere bouillon which pours out on incising the scalp. This condition of deliquescence is not, however, invariable at this stage, as in one very macerated fœtus the brain was remarkably well preserved.

The spinal cord follows much the same course of dissolution as the cerebrum, but is more resistant. The cerebral membranes rapidly become pink in colour, and, in the earlier part of the period under consideration, a red gelatinous extra-dural effusion is frequently found within the vertebral canal.

When the thorax is opened, the viscera are seen to be of a uniform dull strawberry hue. The lungs still preserve their form, but the heart is markedly collapsed, and contains only serum.

The peritoneal fluid is dark red in colour, and sometimes turbid. The liver is noticeably softened, and although often maintaining

its shape *in situ*, collapses on removal. It is reddish-chocolate in shade. The spleen does not show the same degree of softness, and is much darker in colour. The kidneys and suprarenal glands are of a dull strawberry pink, and the former still possess some degree of firmness. The intestines are lustreless, and of a pinkish hue, while the mesentery and omentum are œdematous and opaque.

The pelvic viscera partake of the crushed-strawberry tint which is so characteristic of this stage of maceration. The retro-peritoneal tissues are much infiltrated, and the urine is bloodstained.

Definite changes are now present in bone and cartilage. The red marrow has assumed a dirty yellow colouration, so that in the long bones it is difficult to recognize the epiphyseal lines. Spontaneous separation at the latter is common. Cartilage is now of a bluish-crimson shade, in which the ossifying centres show as miniature yellow islands, these changes being most conveniently studied in the sternum.

Stage III. (40—60 days after death). It is extremely difficult to draw any hard and fast line between the end of the second, and the beginning of the third degree of maceration, but three cases in the present series may be relegated to the commencement of stage three. The scarcity of material is due to the rarity of retention *in utero* for more than forty days after death. During this period, if a fœtus is left lying for any length of time after delivery, its wrappings, however extensive, speedily become soaked through with deeply blood-stained serum.

The scalp now shows some excoriation, and the whole head is flattened antero-posteriorly in a remarkable manner. The features are bloated and almost unrecognizable, the eyes being sunken, and the upper part of the face unsupported, owing to the two halves of the frontal bone lying loosely within the scalp. The nails are still *in situ*, and the epidermis of palms and soles intact. The statement is sometimes made that in maceration the cuticle of the hands and feet is "white, as if poulticed," but this was by no means the case in the majority of specimens examined.

The denuded abdominal wall has a glossy and marbled appearance, while the sheets of semi-detached epidermis are often still thickly covered with vernix caseosa. Strachan[8] contends that in all probability the solution of the vernix is the first stage in the process of maceration, but some of the most macerated specimens in the present series were also the most thickly coated with this material. It is interesting to note, also, in this connexion, the observation of Elsasser, quoted by Feldman[14a], to the effect that vernix caseosa was entirely absent in nearly half of the

fresh newborn fœtuses examined by him. It is obvious, therefore, that this substance cannot prevent ante-mortem maceration of the skin, since it is not always present.

In this third stage of fœtal autolysis, the limbs are markedly infiltrated with cherry-red gelatinous material, which simulates great deformity, the swelling of the fingers, for example, recalling the appearance of tuberculous dactylitis.

The cutaneous and subcutaneous tissues are therefore ruptured with unusual ease, if delivery is at all difficult. A striking feature of the trunk is the curious sinking inwards of the sternum, so that a sharp angle is formed on either side, at the junction of the ribs with the costal cartilages. The sunken abdomen also brings the lower costal margin into marked relief.

Internally, further stages of dissolution have occurred. The muscles are of a pale grey shade, and very soft and œdematous. The periosteum is now so lax that bones, such as the clavicle, slip out of their periosteal sheaths at the slightest touch.

All the viscera are of a dirty fawn colour, their surface vessels showing merely as paler, flattened streaks. The lungs are extremely friable, and on removal, form merely a pulpy fluid.

The softening of both liver and spleen is very noticeable, these organs being greatly shrunken within their capsules, and quite shapeless, even *in situ*. The kidneys, on section, show no differentiation between cortex and medulla. The pancreas is very œdematous, and almost unrecognizable.

The variations in the rate of autolysis of different organs, are, in fact, very similar to those given by Casper, (quoted by Robertson[13]), for the adult organism, in putrefaction.

Placenta and Cord.

The placenta and cord do not show changes *pari passu* with those of the fœtus in its various stages, but in all cases, certain features are recognizable in macerated specimens. The green colouration of placenta and membranes so commonly quoted, however, as a characteristic of maceration, was generally, in this series, conspicuous by its absence. In fact, it occasionally has been seen by the present writer, in perfectly fresh, stillborn fœtuses.

Shortly after death, the umbilical cord still retains its normal torsion, but this is rapidly lost, and a generalized limpness makes its appearance. Oedema, mainly of the Whartonian jelly, quickly ensues, and the normal pearly lustre is succeeded by a pinkish or crimson hue, due to transudation of hæmoglobin from the vessels. On section, the latter gape widely, and in the later stages of maceration, are generally empty.

For a short time after death, however, blood can be expressed from the cut end of the umbilical cord.

The placenta itself, as a rule, is characterized by dullness on its fœtal surface, (due mainly to œdema of the membranes), and by a somewhat slatey colour. Rarely, both membranes and placenta present a dull olive-green tint, which, in some cases at least, is caused by contact with liquor amnii which has been stained deeply with meconium.

In the early days of maceration, the large vessels of the fœtal surface are distended with blood, but in more advanced degrees, they are pallid and collapsed. This condition was well seen in a twin placenta, in which in the half belonging to the living infant, the engorged vessels stood out clearly against a background of bluish-red, while in the portion pertaining to the dead fœtus, the collapsed veins and arteries appeared as whitish flattened streaks on a bluish groundwork. The striking difference in diameter and thickness between these two portions of placenta, was also noteworthy.

In another double placenta, the difference between the non-macerated and macerated umbilical cords was also definitely seen. In this case, as the death of one twin (from retro-placental hæmatoma) had only taken place shortly before delivery, there was practically no difference in the relative sizes of the two halves of the placenta, although the characteristic loss of sheen was noticeable in the macerated half.

The liquor amnii, in a number of these cases, was reported to have been of a dirty brown or green shade. This, however, is not pathognomonic, as it occasionally occurs in perfectly normal confinements.

The microscopic appearances of the placenta will be described in the section on histology.

B. Histological.

In considering the changes occurring in maceration, one is at once faced with the problem of what is the normal histology of the fœtus.

As far as the writer has been able to ascertain, no book has yet been written upon this subject,* and it has only been possible to glean fragmentary notes from the literature, on some of the more important viscera, such as the thymus and liver, and to supplement these by personally comparing normal fœtal organs with those of

*Since this research was carried out, Dr. Eugenia R. A. Cooper has published a volume on "The Histology of the More Important Human Endocrine Organs at Various Ages", while Professor Lucas-Keen and Dr. Evelyn Hewer are pursuing a similar investigation at the London School of Medicine for Women.

the adult. These two types, the fœtal and the adult, show in several instances, striking differences, as, for example, in the lungs, in which the unexpanded pre-natal condition gives the section a quite unfamiliar appearance; or in the thyroid, in which the comparative absence of colloid in the fœtus, with its concomitant non-distension of vesicles, is the rule, rather than the exception.

The practically constant presence of hæmopoietic cells in the liver of the new-born, and the presence of developing glomeruli in the periphery of the fœtal kidney, are also points of difference to be kept in mind.

Not only, however, do the fœtal viscera differ from the adult in many respects, but they also present marked variations from one fœtus to another, even when due allowance has been made for the period of gestation. In a premature fœtus, for example, colloid may be found here and there, in the thyroid, while even in a post-mature child, none of this secretion may be visible, the organ presenting an almost solid appearance.

These difficulties of interpretation are of necessity much intensified, when the organs under examination are in the various stages of maceration.

In order to obtain a normal standard of reference, personally prepared "control" slides have constantly been referred to, these "controls" being sections of fœtal organs from cases in which death occurred in healthy fresh fœtuses as a result of a birth-trauma, or similar accident, and in which, from the examination of the placenta and the Wassermann reaction, other causes of death could be fairly definitely excluded.

Due allowance has also been made for appearances due to asphyxia *per se*, such as, for example, the infiltration of the tissues with red blood-cells, which so commonly occurs in this condition.

The histological appearances in the present series, are noted under the same three headings as the naked-eye changes, viz :—

1. Early maceration. (1—10 days).
2. Moderately advanced maceration. (10—40 days).
3. Advanced maceration. (40—60 days).

The cases described under stage 3, only refer to the earliest part of that period.

The notes on each organ are prefaced by a brief description of the normal fœtal viscus in question, and it may be mentioned at this point, that the histological appearances are ruined in maceration, as the tissues gradually lose their staining affinities during disintegration. A partial exception to this statement is found, however, in certain organs of epithelial origin, such as the thymus, which retain their staining reactions for a longer period than other

viscera. This is especially noticeable on staining with methyl violet.

The tissues were hardened in five per cent. to ten per cent. formalin, and the organs routinely examined, were the thyroid, thymus, lungs, liver, spleen, kidneys, and suprarenal glands. In addition, sections of bone were cut in a number of cases, while in every instance where the placenta and umbilical cord were sent along with the fœtus, slides of these structures were also prepared.

All sections were stained with :—

(*a*) Hæmatoxylin and eosin,
(*b*) Van Gieson's stain, and
(*c*) Methyl violet,

one of the aims of the investigation being to find out what degenerations take place in maceration *per se*.

It was originally intended as a routine, to stain the organs for fat, by Marchi's method, (osmic acid and Muller's fluid) which enables paraffin sections to be made, but a chance reference to Gaylord and Aschoff's[11] "Practical Pathology," showed that this method gives unreliable results with fœtal tissues. It was only possible, therefore, owing to lack of time, to stain a very few frozen sections with Soudan III.

Van Gieson's stain was found particularly useful in placental sections, in which the appearances are often so puzzling, and also in organs in which practically all the parenchyma cells had disappeared, and only the connective tissue framework was left.

The net result of staining with methyl violet was that no changes of an amyloid type were found in maceration. Portions of the placenta and umbilical cord of even fresh fœtuses do, however, assume a reddish tinge in parts, but it must be remembered that the mucin, of which the Whartonian jelly is composed, gives this reaction, as also does the peculiar type of fibro-hyaline degeneration which occurs in the placental villi. It was found impossible, owing to lack of time, to stain such sections with a specific reagent for mucin, such as thionin.

It may also be noted that sections of liver stained with methyl violet show a reddish tinge, owing to the contained glycogen.

Owing to the fact that the fœtal brain disintegrates with such rapidity in maceration, it was found quite impracticable—after experimentation with the various bichromate hardening reagents—to prepare celloidin sections, hence this organ is not included in the following histological notes.

In advanced maceration, however, when the central nervous system is reduced to an emulsion, the highly refractile fatty particles are easily seen with the naked eye, especially in the

presence of sunlight, in which they assume the appearance of fine gold dust.

Each slide in the present series was examined at magnifications of 60, 255, and 555 diameters respectively, the appearances in each case being noted down, and combined later into a composite picture with elimination of any features not due to maceration *per se*.

It may be mentioned here, in passing, that at least in the first two stages of maceration, it is quite possible to recognize and exclude such pathological changes as fibrosis, excessive cellular infiltration, and extravasations of blood into the tissues.

Before considering the alterations occurring in individual organs, it will avoid recapitulation later if, at this point, the changes taking place in connective tissue are summarized, as these are practically constant for every organ.

First Stage of Maceration.

The trabeculæ become hazy and granular, with œdematous separation of the fibres. The fusiform nuclei of the latter, although paler, are still clearly demarcated. The capsule of the organ shows similar changes, while pigment is appearing throughout the tissue, together with hæmatoidin crystals.

Capillaries are seen with difficulty, and are mainly indicated by their swollen endothelium, which is now losing its staining reactions. The larger blood-vessels show shedding of their lining-cells, but are clearly defined.

The circular coats of the arteries are separating into bundles which almost occlude the lumina. The vessel-nuclei are now pale, and chromatin is generally fragmented. Many cells are already disintegrated, while others show coarsely granular protoplasm.

Second Stage.

The trabeculæ no longer appear fibrillated, but are either granular or homogeneous. Chromatin has generally disappeared, but blurred nuclei are still seen. Pigment has greatly increased, and hæmolysis of erythrocytes is universal, with much deposition of hæmatoidin. Capillary endothelium is no longer intact. The lumina of the larger vessels are filled with endothelial debris, but their swollen, disintegrating walls still show irregularly staining nuclei.

Third Stage.

The blurred trabeculæ stain a faint pink with Van Gieson's reagent. A few isolated, mis-shapen nuclei, and stray capillary endothelial cells are yet visible, but later in this period, practically no cells can be identified.

NECK AND THORAX.

1. Thyroid Gland.

Normal Fœtal.

Sections of the fœtal thyroid present marked differences from the adult gland. These differences are mainly accounted for by the comparative absence of colloid in the fœtal organ, which thus often appears of a much denser consistence.

The trabeculæ, which divide the gland into small lobules of varying size and shape, are generally well seen, especially with Van Gieson's stain, and show numerous blood vessels and lymphatics. Even in the normal fœtus, these trabeculæ vary greatly in number and thickness, so that it is frequently difficult to say whether fibrosis is present, or not.

The undistended vesicles are as a rule branched in type, surrounded by a rich capillary network, and lined by cubical epithelium with large nuclei. Many appear to be packed with epithelial cells, but, in some cases at least, this appearance may be due to the section having been cut tangentially.

Portions of thymus tissue, generally containing concentric corpuscles of Hassall, are frequently present, while small groups of round cells with darkly staining nuclei, are often seen. These round cells appear also to be of thymus origin, as, in common with the thymus "rests," they stain a peculiar greenish-yellow with Van Gieson's reagent, and are similar in type to the cells of that gland.

First Degree of Maceration.

The gland is quite recognizable as thyroid. Colloid, when present, is assuming a reticular form, but most of the vesicles are loosely filled with swollen or disintegrated epithelial cells. Many of these cells show coarsely granular protoplasm which is losing its staining reactions.

Second Degree.

Early in this period the tissue can easily be identified, although here and there, irregular areas of disintegration are appearing. Later, however, it becomes increasingly difficult to recognize it as thyroid. Practically no colloid is visible, and the section has a somewhat solid appearance.

No definite nuclei are now seen within the vesicles, but the small round nuclei of any thymus "rests" which may be present, still stain sharply and deeply.

Small clear spaces, partially filled with irregular, darkly staining amorphous masses, are visible here and there within the

lobules, and probably represent vesicles previously distended with colloid, but now merely containing disintegrated epithelium.

Third Degree.

Staining is now very faint, and the tissue somewhat resembles a "skeleton-leaf." Entangled in its fine reticulum are a few faintly staining masses of protoplasm which represent epithelial cells undergoing karyolysis.

2. The Thymus.

Normal Fœtal.

Nothing can be added to the textbook descriptions of this gland, except the statement that even in normal fœtuses the lobules vary markedly both in size and in number.

First Degree of Maceration.

Commencing disintegration is manifested by the appearance of "cracks" in the section, dividing it into irregular islands, while staining differentiation between cortex and medulla is rapidly lost.

The majority of the normal granular cortical cells are still distinguishable from the lymph-corpuscles by their larger size and their paler stain, but many cells are contributing to the formation of a ground-work of granular and disintegrated protoplasm.

The corpuscles of Hassall still show their affinity for eosin, but are becoming somewhat granular and homogeneous-looking, although their concentric formation can still be made out. Their endothelioid outer flattened cells show pallor of nuclei, with disappearance of "stippling".

Second Degree.

Although paler, the section is still recognizable as thymus.

The cortex pulp is now as open-meshed as that of the medulla, and the granular cells of the former are indistinguishable from the breaking-up lymph corpuscles except by their size, which is nearly twice as large.

Many concentric corpuscles are so far fairly intact, while others are quite homogeneous, though still staining with eosin.

Third Degree.

Staining is now extremely pale, but the gland is still recognizable by its lobular arrangement. Faint traces of the concentric corpuscles are yet visible.

3. The Lungs.

Normal Fœtal.

The fœtal lung, in its unexpanded condition, is markedly different from the adult organ, being more suggestive of a secretory gland. The undistended alveoli, which appear as small, empty

spaces in a cellular ground work, are lined with somewhat cubical epithelium. When these alveoli are cut tangentially, the epithelial cells which appear to fill them, are seen to be irregular in shape, as in the adult. In the fœtus, however, the nucleus occupies more of the cell.

The boundaries between contiguous unexpanded alveoli appear relatively thick, but the actual connective tissue fibres are difficult to define, owing to the predominance of cellular elements. The bronchi show columnar lining cells, as in the adult, while their much infolded and unexpanded walls are almost in apposition.

The endothelium on the free surface of the pleura is well marked, and the vessels and lymphatics of the latter are congregated in the deeper layers.

Both pleura and trabeculæ vary very much in thickness, even in the normal fœtus.

The capillary network of the alveoli is well seen, the endothelial nuclei staining more darkly than those of the alveolar epithelium.

First Degree of Maceration.

The earliest evidence of this process consists in the detachment of the bronchial epithelium, which rapidly fills the lumina of the tubes in the form of small, segmented masses of cells. Before karyolysis finally occurs, the chromatin becomes fragmented and massed near the nuclear membrane. Detachment of the pleural endothelium is commencing.

Many of the swollen and granular epithelial cells lining the alveoli are still *in situ*, and show irregularly staining nuclei. When the alveoli contain many loose epithelial cells, it is difficult to define their somewhat cellular boundaries.

Second Degree.

The paler sections are still easily recognizable as lung. Karyolysis of the bronchial epithelium is now almost complete, while the alveoli are loosely filled with amorphous or shred-like protoplasmic debris.

Third Degree.

In the earlier part of this stage, the tissue can still be identified, but later, it assumes the lace-like appearance of a "skeleton-leaf," and is only recognizable by the pale epithelial debris of the bronchi, and by the cartilaginous plates of the larger tubes.

The majority of the lining cells of the alveoli have entirely disappeared.

Hyaline coagula are sometimes present in the large vessels. These evidently consist of disintegrated red blood corpuscles, and are analogous to the hyaline thrombi sometimes found in the capillaries in certain infective diseases.

ABDOMEN.

1. The Liver.

Normal Fœtal.

As in the adult, the outlines of the lobules are very ill-defined, the best guide to the latter being the portal spaces. In the fœtus, however, the columns of liver cells do not converge in such regular lines towards the central vein, but, especially in the periphery of the lobules, are arranged more in the form of a reticulum. Sometimes, indeed, there are no converging columns to be made out even centrally, the whole lobule being reticulated.

The cells in the columns are often found two or more abreast. The stellate cells of Kupffer, which line the adult sinusoids, are difficult of demonstration in the fœtus, and in general are represented by flat and very small nuclei. A certain degree of round-celled infiltration is now recognized to be physiological, (W. M. Feldman[14b]), and has been frequently found by the author in perfectly healthy fœtuses. The nuclei of these small round cells vary in size, but are smaller than the nuclei of the liver cells proper, and stain more darkly. These cells occur either as small aggregations in the liver parenchyma, or, more generally, in the lumina of the sinusoids, and infiltrating the periportal connective tissue.

First Degree of Maceration.

Early in this stage, the section is still recognizable as liver-tissue, but towards the end of the period it is difficult to identify, except by the position of the portal canals.

The columnar cells lining the bile ducts are commencing to be shed, although their nuclei still stain deeply. Numbers of normal small round cells are visible, with darkly staining nuclei, while columns of liver cells are seen here and there, the individual cells being either pentagonal and clearly outlined, or beginning to show swelling and distortion.

Later in this period, the tissue stains a paler hue *en masse*. The lobules are now indistinguishable, the columns of liver cells being irregularly segmented into small groups, or single cells, which are swollen and mis-shapen, and scattered indiscriminately over a finely granular background. Under a high magnification, the nuclei and nucleoli of these cells are just seen, the nuclear membrane and chromatin network being only faintly visible.

In the larger bile ducts, the columnar lining cells have disappeared, and the walls are practically homogenous. The larger branches of the portal vein are well defined and gaping, but the smaller veins are collapsed, and appear merely as irregular chinks in the swollen connective tissue.

The nuclei of the small round cells, and of the stellate cells of Kupffer are no longer distinguishable by their staining reactions, from those of the parenchyma cells.

Second Degree.

In this stage, identification is generally almost impossible, the foregoing changes all being intensified, and the tissue separating into irregular shreds. Its groundwork now consists of amorphous debris, with, here and there, more darkly staining granular masses of undifferentiated liver cells, showing a few "ghosts" of distorted nuclei. Traces of small round cells are occasionally seen, but there is no evidence of sinusoids nor stellate cells. The capsule of the liver is shred-like, and becoming detached.

Third Degree.

The organ now shows marked autolysis, sections appearing merely as an open meshwork, studded with small, slightly darker masses of amorphous parenchyma cells. The remnants of the portal canals are now the only means of recognizing the tissue as liver.

2. The Spleen.

Normal Fœtal.

Much variation occurs in normal instances, especially with regard to the size and number of the Malpighian corpuscles, which can generally be seen with the naked eye. Even in the same field of the microscope, some of these corpuscles may be three times the size of others. According to the plane of section, they may appear round, oval, or branched, and normally, in transverse sections, the arteriole is excentric.

The capillaries of the Malpighian corpuscles are difficult to define, as their endothelium closely resembles the endothelioid cells lying on the strands of the reticulum of the adenoid sheaths.

Numerous minute aggregations of lymphoid tissue, without visible central arterioles, are well seen, and the large trabeculæ are generally very distinct, with well-defined vessels.

The capsule varies much in thickness, even in normal fœtuses. The spleen-sinuses, with their endothelium, are always easily distinguished, and frequently show the familiar "barrel-hoop" effect. In the specimens examined, giant-cells were very few in number.

First Degree of Maceration.

The sections are easily recognizable as spleen, although showing commencing disintegration in parts. The Malpighian bodies, with their arterioles, are quite distinct, and the spleen sinuses are visible, although their swollen endothelium stains less deeply. The "barrel-hoop" effect is still seen.

In the early part of this stage, the endothelioid cells of the reticulum can easily be distinguished from the lymphoid cells of the pulp by their oval shape and lighter stain, but later, when these lymph-cells lose their staining reactions and become distorted, differentiation is much more difficult.

Second Degree.

In the first part of this period, the changes just described are accentuated, and sections show variation in staining capacity. Later, however, the fragmented tissue can only be identified by means of its trabeculæ. Malpighian bodies are no longer defined, and sinusoids are made out with difficulty. Numbers of undifferentiated splenic cells are agglutinated into small distorted masses, although, here and there, a few lymphoid cells show fairly clear staining reactions.

Third Degree.

Sections are now as a rule unrecognizable as spleen, and all remaining nuclei are extremely pale and deformed. Fragments of sinusoids are apparent here and there.

3. The Supra-renal Glands.

Normal Fœtal.

"Control" sections of this organ are difficult to obtain, owing to the relative rapidity of autolysis, and the length of time which must necessarily elapse before permission for a post-mortem examination is granted.

The fœtal gland is as large as that of the adult, and sometimes even larger. It is enclosed within a capsule from which fine trabeculæ converge towards the centre of the organ. There is invariably a well-marked zona glomerulosa, which is occasionally wider than that of the adult. The cells of this zone simulate an alveolar arrangement here and there, but are invariably cuboidal or polygonal in type, and not columnar, as in the fully developed individual. They show a special affinity for hæmatoxylin, both nuclei and cytoplasm staining deeply. The latter is definitely granular. The zona fasciculata varies greatly in normal fœtuses, being sometimes reticular, and, as a rule, only differentiated just internal to the zona glomerulosa. It may, however, be four or five times the depth of the latter. Its cells are polygonal, larger than those of the outer zone, and contain much paler nuclei. The zona reticularis and the medulla merge insensibly into each other, the reticulum of the latter being characterized by a much wider cell-meshwork enclosing sinusoids. The cells of the zona reticularis occasionally contain fine pigment particles, while the cells of the medulla are very large and finely granular.

When autolytic processes are under consideration, it must be remembered that normally the cortical supra-renal cells contain minute fat-globules, which, after being dissolved out during paraffin embedding, appear as tiny vacuoles.

First Degree of Maceration.

The organ is still identifiable as the supra-renal gland. The zona glomerulosa still stains more darkly than other zones, but its cells are now somewhat swollen and distorted. Many are completely disintegrated, and the remaining nuclei vary greatly in staining reactions, some having almost disappeared.

Detachment of the capsule has commenced, and the position of the trabeculæ is merely indicated by isolated capillary endothelial nuclei.

In the zona reticularis and medulla, the reticulum is now only represented by small segmented masses of cells with pale or almost invisible nuclei, scattered indiscriminately upon a background of granular, disintegrated protoplasm.

The medullary sinusoids, however, are still visible.

Second Degree.

Only in the earlier part of this stage is the faintly staining tissue at all recognizable. Later, it consists of a fine granular connective-tissue meshwork, containing, here and there, small masses of protoplasmic debris.

The zona glomerulosa is merely represented by clumps of disintegrated cells, generally without any nuclei. Just under the capsule, (for a depth of about one millimetre under a low power) these clumps still stain slightly more darkly than the remainder of the tissue. When isolated nuclei are still present in this zone, they are distinguished from the amorphous cell-masses only by their uniform size, and not by their staining reactions.

In the inner zones, here and there ill-defined polygonal, or stray endothelial cells can still be seen.

All traces of medullary sinusoids disappear later in this period, while the last cells to lose their staining capacities are the lymphocytes.

Third Degree.

Sections now stain only with difficulty, and are undefinable unless previously labelled. Any remaining cells are rapidly disintegrating.

4. The Kidneys.

Normal Fœtal.

The glomeruli are much smaller and more numerous than in the adult, and towards the periphery of the organ, may be seen, as

a rule, in different stages of development. They also vary in size throughout the cortex, but do not become uniformly smaller in the region of the kidney-capsule. The latter, in the fœtus, also varies considerably in thickness.

Differentiation into cortex and medulla is well seen, and the medullary rays are rather more sinuous in outline than those of the adult. The tubules also are, in general, much smaller and more numerous, and show well-marked basement membranes. The capsule of Bowman is lined with flattened epithelial cells, as in the fully developed organ. In the convoluted tubules (which are most clearly seen towards the boundary-zone), the Altmann granules are not arranged at right angles to the basement membrane, but are indiscriminately scattered throughout the cytoplasm. The latter stains deeply with eosin, and, after death, disintegrates with great rapidity. The nuclei of these cuboidal granular cells are smaller and darker than those of the clear flattened type which line the descending limbs and loops of Henle, and the junctional tubules of the labyrinth. The collecting tubules in the medulla show either cubical or columnar epithelium, while the ducts of Bellini are lined with a definitely columnar type.

First Degree of Maceration.

The glomeruli are clearly seen, with epithelial nuclei in many cases showing pyknosis, and the medullary rays are differentiated from the surrounding labyrinth.

In the cortex, the granular cells of the convoluted tubules show marked blurring and disintegration, with detachment and consequent obliteration of the lumina. Their nuclei are either pale or non-existent, and show no evidence of chromatin. In the ascending limbs of the looped tubules, however, these cells do not appear to disintegrate so rapidly, as their nuclei retain their staining affinities for a somewhat longer time. The clear cuboidal epithelium of the junctional tubules, and of the straight tubules of the medullary rays, although becoming swollen and slightly granular, presents a marked contrast to that of the granular type of epithelium, its nuclei still staining deeply. In many cases these clear cells are detached *en masse* from the basement membrane.

In the medulla, the cells in general are in a better state of preservation than those of the cortex, all the various types of tubules being differentiated, although, in the majority of instances, their lining epithelium is detached, and is seen lying as a complete ring in the lumen.

The columnar cells of the ducts of Bellini are very distinct, although their protoplasm is becoming swollen and disintegrated, and their nuclei are commencing to undergo karyolysis. The loops

of Henle and the collecting tubules still generally show well-stained nuclei.

Second Degree.

The tissue now shows considerable disintegration, especially in the cortex, which is becoming segmented into irregular islands. Outlines of tubules can still be made out in both the cortex and medulla, although recognition of types is almost impossible, owing to the widespread karyolysis of nuclei.

The glomeruli are still differentiated, however, although pale and disintegrating. Their epithelial nuclei have either vanished or become mere shadows. The capsules of Bowman have either disappeared or are very ill-defined. Medullary rays are still partially visible.

In the cortex, it is occasionally possible to recognize the ascending limbs of the looped tubules by the thickness of their remaining epithelium, which now appears as short, non-nucleated segments, still showing a special affinity for eosin. The lumina of the convoluted tubules are now choked with granular debris in which no nuclei can be made out. In the junctional and straight tubules, the cells are swollen, distorted and detached, with a few irregularly staining nuclei still visible.

The medullary groundwork is extremely granular, and the ducts of Bellini, owing to their size, are the only portions of tubules which can be identified. Their columnar cells are now lying loose and broken-up in the lumina. When any of their nuclei are still visible, these stain either with hæmatoxylin or eosin, even side by side in the same tubule.

Third Degree.

The tissue is still recognizable by means of the glomeruli, which stand out as slightly darker homogeneous masses upon a paler background. Numbers of these have now disappeared, while the medullary rays are no longer differentiated.

In the cortex, traces of ascending and straight tubules are visible as slightly darker lines, while small masses of very granular cytoplasm are all that is left of the convoluted tubules. A few isolated cells, with nuclei still visible, represent the last remains of the junctional and straight tubules of the labyrinth and medullary rays.

In the medulla, the transverse sections of the ducts of Bellini contain merely swollen, hazy non-nucleated masses of protoplasm, in which a faint trace of central lumen is visible. Shadows of the collecting-tubules and loops of Henle, can occasionally be made out.

BONE.

Normal Fœtal.

Little need be added to the text-book descriptions of developing bone. The periosteum is, as a rule, differentiated into an outer lamellar layer, staining deeply with eosin, and an inner osteogenetic layer, in juxtaposition with the periosteal bone. The trabeculæ show very clearly the central calcified cartilage, staining a rich violet-blue with hæmatoxylin, and the secondary bony layers surrounding this, which have a marked affinity for eosin. Embedded osteoblasts are chiefly seen in these secondary deposits. The free osteoblasts which are found clinging to the latter, are frequently spindle-shaped, and, when the nucleus appears to be situated at one pole, bear a striking resemblance to tiny tadpoles. Osteoclasts are most plentiful near the epiphyseal line, where new medullary spaces are being excavated, and there are as yet no secondary deposits. They are extremely large multi-nucleated masses of protoplasm, in shape like a giant amœba.

First Degree of Maceration.

Owing to its remarkable resistance to maceration, the bony tissue in the specimens examined, presented scarcely any noteworthy changes, even when autolysis of the fœtal viscera was far advanced.

In this first degree of maceration, sections show little diminution in general staining capacity. In the periosteum, the outer lamellar layer is well defined, but the nuclei are definitely paler. Cartilaginous cells are still dark in colour, but the embedded osteoblasts of the trabeculæ show variations in staining power. In the marrow, numbers of cells show pallor, while others are granular and disintegrating. Osteoclasts show commencing karyolysis of nuclei, while the free osteoblasts are pale, granular, and somewhat swollen.

Second Degree.

The fibrous layer of the periosteum is now rather œdematous and granular, but pale nuclei can still be made out, and its blood-vessels are well seen. The osteogenetic layer is more blurred and indistinct. Cartilage nuclei are a little paler, as are also the embedded osteoblasts. Osteoclasts are still visible, with distorted, shadowy nuclei, and finely granular cytoplasm.

Third Degree.

The general staining is now much paler, but the essentials of bony tissue can still be distinguished. Separation of periosteal fibrous lamellæ is now taking place, and the osteogenetic layer is loosened from the periosteal bone. Trabeculæ stain fairly well, although the nuclei of their embedded osteoblasts have practically disappeared. A few marrow cells retain their staining capacities,

but the majority are disintegrated, forming a granular fibrin meshwork. Osteoblasts and osteoclasts, although faintly staining, are still visible here and there.

THE PLACENTA.

Normal Senile Organ.

In the normal ripe placenta, changes of a retrogressive type are invariably found, and chiefly manifest themselves by the formation of fibrinous infarcts, which may, or may not be visible to the naked eye. Such infarcts were seen in the present series, in all stages of development. Their first appearance is in the intervillous spaces, where fibrin deposited from the maternal blood, becomes transformed into a homogeneous hyaline material staining deeply with eosin. This hyaline substance is frequently seen surrounding isolated villi in the form of a complete ring, as well as welding them together into large functionless masses. When the stroma of a villus becomes itself invaded, the process invariably commences at a place where the epithelium has disappeared, and spreads rapidly from that point.

Embedded villi normally show various retrogressive changes. At first the vessels are still patent, and contain red blood corpuscles, while the stroma, although pale, shows visible nuclei. Remnants of villous epithelium may yet be apparent. Later, however, these villi appear as mere "ghosts," among the more deeply staining fibrin, and contain no traces of either vessels or reticulum. Finally they become completely identified with the fibrin itself, although a few shadowy nuclei may persist in the latter. In addition to this commoner type of infarct, two other forms may be briefly commented upon.

One is the so-called "non-fibrinous infarct" described by Eden,[9] in which large numbers of avascular villi are massed together without intervening fibrin, and in which the cause is supposed to be due to the blocking of maternal arteries supplying the affected cotyledon.

The other, which has been described by Holland,[10] consists in the welding together of numbers of villi by degenerated epithelium, which stains almost blue-black with hæmatoxylin, and is coarsely granular. This form of infarct, which was frequently seen in the present series, is often apparently accompanied by budding of these very darkly staining cells.

With reference to the normal epithelium of the villi, this consists after the fifth month of gestation, of merely a single flattened layer of cells, with much smaller and darker nuclei than those of the villous stroma, and with definitely granular cytoplasm.

Giant cells may usually be found in the intervillous spaces,

and contain pale nuclei, and ingested granular debris. In the maternal portion of the placenta, the decidual cells, which are mainly pentagonal, with very large, dark nuclei, are often embedded in fibrin.

Towards the end of pregnancy, the larger chorionic stems frequently show obliteration of their vessels by endarteritis.

First degree of maceration. The placenta retains its vitality for a remarkable length of time, since the maternal circulation does not cease simultaneously with the death of the fœtus. Hence the changes to be observed in maceration are slight, compared with those seen in the fœtal viscera. Moreover, it is often extremely difficult to distinguish post-mortem from ante-mortem transformations.

In the umbilical cord, however, certain changes are visible, and especially in the vessels, which show marked dilatation, with commencing pallor of the nuclei of their walls. The epithelium covering the umbilical cord, is definitely swollen, while the nuclei of the Whartonian jelly are beginning to undergo karyolysis. Fine pigment granules are visible here and there in the mucoid tissue, and the endothelium of the umbilical vein and arteries is commencing to disappear.

In some of the placental villi, the stroma now appears vacuolated and disintegrating, while its nuclei are swollen, paler, and more granular, although still clearly defined. The endothelium of the larger chorionic stems shows commencing detachment, while that of the capillaries is giving way here and there. The fœtal erythrocytes, however, are mainly intact.

Villous epithelium is still very distinct, although a little swollen.

In the intervillous spaces, slight disintegration of red cells is taking place, with consequent formation of fibrin filaments, and deposition of traces of pigment.

The decidual cells show paler nuclei, in which the chromatin is occasionally massed at the nuclear membrane. Their protoplasm is definitely granular.

Second degree. The vessels of the umbilical cord exhibit commencing separation of the constituents of their blurred and swollen walls, while in the Whartonian jelly a fine granularity is distinctly visible.

The stroma of the villi and the larger chorionic stems is also granular, and shows, in parts, disintegration and disappearance. Here and there, it has shrunk from the surrounding epithelium, which is mainly intact, although definitely paler. The villi, as a whole, demonstrate irregularity of staining power, and much of their epithelium shows a strong affinity for hæmatoxylin. Many so-called "buds" of this inky looking material are visible.

The fœtal vessels are generally somewhat dilated, but red cells, as a rule, maintain their integrity.

The decidual cells show pallor and distortion of nuclei, with considerable variation in staining reactions. Their swollen cytoplasm is here and there becoming disintegrated.

Third degree. As only one placenta was available for examination in this group, no deductions can be drawn from the appearances noted. The staining powers of the tissue were, however, surprisingly good. Red blood corpuscles showed evidences of disintegration both in fœtal capillaries and intervillous spaces, while the membranes were œdematous and granular.

PART III.

The Nature of Fœtal Maceration.

The changes which the normal fœtal tissues undergo *in utero*, subsequent to somatic death, differ markedly according to whether the membranes remain unruptured or not. In the latter case, organisms from the vagina ultimately gain access, and the processes which ensue, are those of ordinary putrefaction. When the membranes continue intact, however, a peculiar non-organismal form of dissolution takes place, and this alone will be considered in the present section. Not only, however, are the immediate surroundings of the dead fœtus sterile, but also its respiratory and alimentary tracts—those areas which in the adult cadaver largely initiate the processes of putrefaction. It is interesting to note in this connexion, that if the dead body of an individual who has lived, be at once dismembered, the limbs take a considerable time to putrefy. (Brouardel and Benham[17])

This aseptic softening of the tissues in maceration, is of the nature of an autolysis, and consists in the breaking-down of the complex protein molecules into simpler compounds by proteolytic ferments contained in the cell-bodies themselves. These cytolysins are specific for various types of cells, and their albuminoid decomposition-products consist mainly of peptones and hemi-albumins—substances with smaller molecules. (Thoma[18a])

It has also been found that at the end of the first day of experimental autolysis *in vitro*, the cells contain certain myelin bodies, which are probably of the nature of lecithin compounds. The latter increase markedly during the first 24 hours of incubation at 37° C., and, after further autolysis, diminish greatly, with a corresponding increase in fatty acids. (Waldvogel and Dietrich, quoted by Adami[19a])

It is probable, according to Albrecht and Dietrich, (also quoted by Adami[19a]) that this increase of lecithin is derived primarily

from the nuclear chromatin, since these authors have noted that the latter commences to undergo solution and disappearance, *pari passu* with the advent of the myelin granules in the autolysing cells. It may be mentioned in connexion with fatty degeneration, that Hildesheim and Leathes (*vide* Adami[19b]) have demonstrated that there may be from 10 per cent. to 40 per cent. more fat recoverable from cells which have undergone experimental autolysis for three days, than from those of the fresh organ.

A certain breaking-down of cells takes place, of course, physiologically in the living body, subsequent to the normal wear and tear of the tissues, but, in such cases, the leucocytes play an important part in ridding the organism of effete cells by the ingestion of debris.

In the muscle-fibres of the involuting uterus, for instance, as Adami[19c] pointed out, cloudy swelling and fatty degeneration also normally occur. In this connexion, also, J. R. Coats[20] drew attention to the observations of Hoppe-Seyler upon milk—a normal body product—which during the first day after its withdrawal from the maternal organism, becomes richer in fat, and poorer in its nitrogenous casein.

Concomitantly with these chemical transformations, definite histological changes take place in the cells themselves during maceration.

As has been noted in the section on histology, granularity of the cytoplasm is an early and practically constant feature, and is later accompanied by swelling, with gradual loss of the cell-outline.

Such a condition of the protoplasm is a true granular degeneration, indicative of cell-death. It is a preliminary to liquefactive necrosis, and as Adami[19d] has pointed out, must be distinguished from cloudy swelling, which is primarily an evidence of disordered metabolism in the living cell. Verworn[21] has demonstrated a somewhat analogous, though extremely rapid granular disintegration in experimentally-wounded Infusoria. If the latter be cut into two on the microscopic stage, then, to use his picturesque phrase, "death can be followed by the eye, and its course resembles that of a spark that passes over a fuse, and leaves behind it merely a loose mass of ashes."

An even more instructive phenomenon was observed by him in hyaline Rhizopoda, which, when cut, gradually undergo a similar granular disintegration commencing at the site of the lesion.

With regard to the presence of fat granules, these were occasionally noticeable in paraffin sections in the present series, in which they appeared in the form of small vacuoles in the autolysing cytoplasm, but it was extremely difficult to differentiate such

swollen and distorted cells from the "granular corpuscles of Gluge."

In the frozen sections stained with Soudan III, very few orange globules were visible.

Cruickshank,[11] experimenting with over two hundred animals, was unable to demonstrate fat in autolysing tissues by any of the known methods of staining; but Lempereur[2] in his own research, satisfied himself as to its presence by means of ether. The author experimented with this reagent on several fragments of untreated macerated tissue, and was able to note the solution of the minute oil globules, as the ether penetrated under the coverglass.

With regard to the histological appearances of the nuclei, these in some cases undergo a preliminary pyknosis before dissolution, but the most frequent change noted in this series was a gradual karyolysis, in which the nuclear membrane was the last structure to disappear. According to Thoma,[18b] such a karyolysis has nothing to do with the coagulation of fibrin or of albuminoid matter in the cell-bodies, since in recent coagula the leucocytes stain easily, as also do the nuclei in cells coagulated by alcohol.

Subsequent to the granular disintegration and karyolysis just described, the cells undergo liquefaction, a process which, under the name of "colliquative necrosis," occurs pathologically in the living body in the case of infarcts of the brain, or of tumours with central softening. Total liquefaction of the viable fœtus *in utero* does not of course occur, owing to the large mass of tissue involved, but is occasionally well seen, in the absorption of early embryos within the intact amniotic sac.

These degenerative processes in the cells manifest their presence by a progressive diminution in staining capacity, although the latter was found to vary considerably in different fœtuses.

It is possible that by the use of suitable mordant reagents more clearly defined sections might be obtainable in the later stages of maceration.

Considering, in the next place, the various factors which affect the processes of autolysis, it is obvious that the temperature, the reaction of the surrounding medium of the cells, and the state of metabolism of the organism at the time of death, must all have an important bearing upon the progress of fœtal maceration.

In this connexion it is interesting to note that a considerable amount of experimental work on autolysis *in vitro*, has been carried out by various workers.

With regard, in the first place, to the effect of temperature, von Baerensprung (quoted by Feldman,[14c]) demonstrated in 1851, that the normal uterine temperature in pregnancy is higher than the intra-peritoneal, while the living fœtus registers a slightly higher

figure than the uterine cavity itself. The dead fœtus, however, has a temperature lower than that of the containing uterus. (*ibid*).

Cruickshank[11] carried out several instructive experiments *in vitro*, with regard to the inhibition of autolysis by heat, and found that after a preliminary exposure of the tissues to 57° C. for 12 to 15 hours, no definite histological changes were discoverable at the end of a further incubation of even ten days at 37° C.

While, of course, such marked variations in temperature are never found in the living maternal organism, it is nevertheless a possibility that the very high temperatures sometimes registered in such febrile diseases as pneumonia, may have a slightly inhibitory effect on the rate of autolysis of a dead fœtus *in utero*. Unfortunately, the number of such cases in the present series is too small to permit of any conclusions being drawn from them.

The reaction of the surrounding medium also plays an important part with regard to the velocity of autolytic processes. In this connexion, Mendel and Leavenworth[12] quote Wiener as having demonstrated that autolytic ferments scarcely act until the tissues show acidity, and that an alkaline reaction exerts a definitely retarding influence. Such acidity of the tissues normally occurs a few hours after death.

The reaction of the surrounding liquor amnii must also be borne in mind. This is normally faintly alkaline or neutral. As maceration advances, however, and the large sero-sanguineous bullæ of the fœtal epidermis rupture and discharge their now acid contents into the surrounding fluid, the latter must itself tend to become faintly acid, and thus form a more favourable medium for the autolysis of the surface tissues.

Blood-serum *per se*, also markedly inhibits autolysis (Schryver, quoted by Cruickshank[11]), hence the amount of blood in any one organ probably definitely affects its dissolution. Cruickshank, in the experiments already referred to, draws attention to this fact, and is careful to point out that the animals which he used, had been killed by bleeding.

The state of metabolism of the fœtus also affects maceration to a considerable extent, and the rate of the progress of macerative processes.

The disappearance of very early embryos is not only dependent upon their size, but also upon their velocity of growth. It is well known, also, that premature fœtuses undergo maceration relatively more rapidly than full time specimens. Similar confirmatory evidence of the effect of bodily metabolism upon the processes of dissolution is available from animal experiments. It was demonstrated, for example, by Jackson, (quoted by Cruickshank[11]), that

the tissues of young animals undergo autolysis more rapidly than those of older ones.

What is true regarding the influence of bodily chemical processes as a whole, upon the rapidity of general autolysis, is also true of the influence of individual organs and cells upon the rate of their own disintegration.

The rapidity of maceration of the liver—an organ possessing marked metabolic activity—has already been noted in the section on histology, and contrasts in a striking manner with the resistance of such a viscus as the kidney.

In this connexion, Lane-Claypon and Schryver[13] found on experimentation, that in a given period of time, not more than twenty-five per cent. of the kidney-proteins become disintegrated *in vitro*, at 37° C., as compared with fifty per cent. of the liver-substance.

It has also been pointed out in Part II, that highly-functioning individual parenchyma-cells invariably disintegrate more rapidly than the less-specialized connective tissue cells of the same organ.

It will thus be seen that a number of factors exert an important influence upon the processes of intra-uterine maceration; and that further research, upon a much larger scale than anything hitherto attempted, is necessary if these factors are to be assessed at their true importance. As a prelude to such investigation, a more accurate and immediate diagnosis of fœtal death *in utero* in the later months of pregnancy, is required. Then, and then only, will the time of retention within the maternal organism be definitely known, and the valuation of the various influences which modify the stages of maceration be placed upon a scientific basis.

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Acute Post-Partum Œdema of the Cervix Uteri.

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The rarity of acute post-partum œdema of the cervix seems sufficient justification for reporting the following case.

Mrs. S. Aged 28. Housewife. The patient gave a history of three previous full time normal labours which occurred seven, six and four years ago respectively, the children being of average size acording to her own statement. Her first labour occupied two hours, the second only a few hours, while the third, which she described as being the most tedious, was seven hours. In each case delivery was unassisted, the perineum was not torn, and she had never since been troubled by any degree of prolapse.

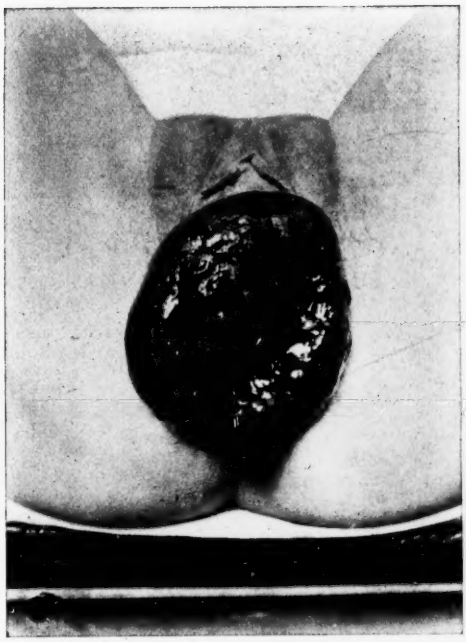
The history of this pregnancy and labour is as follows:—

A male child weighing eight pounds was born on January 30th, 1925, one month post-mature from the alleged date of her last menstrual period. The labour was sudden and precipitate, the patient being engaged in washing clothes when she felt a sudden desire to defæcate and went to the chamber. The child was then born with the first pain while she was in the sitting position and was precipitated into the chamber, the placenta following immediately after the child. There was no further bleeding. Immediately after the birth she noticed a fleshy lump outside the vulva which rapidly increased in size, caused considerable pain, and was very tender to the touch. Her doctor was sent for, diagnosed inversion of the uterus, and sent her to the hospital where I saw her two hours after delivery.

On admission she was suffering from a moderate degree of shock, felt weak and very faint, and showed marked pallor. The pulse rate was 116 and the temperature was 99°F.

On examination, the abdomen was very flaccid, the uterus was moderately contracted and mobile, the fundus being at the level of the umbilicus, and there was no abdominal or uterine tenderness.

Projecting from the vulva was a large bluish-red and deeply congested fleshy mass about the size of a small melon. As I had seen two cases of post-partum uterine inversion some years ago, it was at once obvious to me, that this was a totally different condition, for while in the former cases the projecting mass was rather pale, smooth, ovoid and symmetrical, in this case the mass



Acute Post Partum Oedema
of the
Cervix Uteri.

was cone-shaped with the apex in the vulva, and was, in the lower two-thirds, distinctly nodular and roughened, the rough area being a deep bluish-red colour from congestion. Measurement outside the vulva showed the mass to be $4\frac{1}{2}$ inches long, 5 inches broad at the base and 2 inches broad at the narrow upper part where it emerged from the vulva.

On tracing up the sides of the mass they were found to run up to the vaginal fornices, the posterior fornix being quite high up and in the normal position, while the anterior fornix was almost obliterated owing to the descent of the anterior vaginal wall with the mass. It is interesting to note that the anterior vaginal wall was under considerable tension from the weight exerted upon it by the hypertrophied and œdematous cervix and was not sagging down as in an ordinary cystocele. The cervical canal was found to be on the left side of the broad expanded base, most of the swelling being in the anterior, right and posterior cervical lips. The lower surface corresponding to the vaginal aspect of the cervix was dark red, almost black in colour, and had a nodular glistening appearance, the surface presenting many small abrasions and being covered in parts by a sero-sanguinous exudate. The upper and tapering portion was not quite so deeply coloured, and was smoother and less nodular but no clear line of demarcation between the two portions was observable. The whole mass was covered with small abrasions, some blood clot and a sero-sanguinous exudate, but no distinct lacerations could be seen.

On palpation the mass was extremely tender, very tense and only pitted slightly on pressure. The patient complained of pain in the projecting mass and of a dull dragging pain in the lumbar region, the lower abdomen and groins.

Previous Medical History. The patient had always been healthy, but had had a persistent cough with expectoration during the later months of pregnancy, accompanied by night sweats. On examination a small area of active tubercular disease was found in the apex of each lung. No other pathological lesion was found.

General Condition on Admission. The patient was pale and rather collapsed, tongue furred and breath foul. Conjunctivæ pale and facies somewhat sunken and emaciated. Her general muscular development was poor and there was slight general wasting.

Treatment. The whole mass was cleaned by pouring on it a stream of warm eusol, the fornices also being douched with the same solution. It was then thoroughly bathed in spirit and, by steady and firm pressure with some compression, the mass was gradually pushed back into the vagina, the anterior wall being pushed up first as in the reduction of a procidentia. The vagina

was then lightly packed with gauze soaked in eusol, a firm pad was put on the vulva, and the foot of the bed was raised.

The subsequent history is interesting. On the following day the mass again protruded after removal of the packing but had decreased in size by about one-third and was rather less dark and congested in appearance. On the second day it protruded twice and was still smaller, and on the third and fourth days it appeared outside the vulva several times, and was then about half the original size. After this it was not again seen, but on bimanual examination on the seventh day, the cervix was still somewhat enlarged and irregular, rather like a hypertrophied cervix associated with prolapse, and there was still some slight sagging of the anterior vaginal wall. During the first week there was considerable vaginal discharge, rather offensive and considerably more than a normal lochia, and the patient ran a temperature varying from 100°F. to 103°F. For this reason she was transferred to the isolation hospital on the seventh day though at no time did she show the characteristics of puerperal sepsis, the temperature being probably due to the tubercular lesion. She was kept in the isolation hospital for five weeks on account of slight rise of temperature, and was then discharged.

I saw her again, three months later, on October 10th, 1925. She did not complain of any pelvic symptoms and on being questioned would not admit of any sensations usually experienced by those suffering from prolapse or protruding cervix. On bimanual examination I found the uterus to be small, anteverted and mobile, the appendages being easily palpable and normal. The cervix was small and healthy, there being no erosion, and except for a small scar on the left side, very like a nulliparous cervix. The vaginal walls were slightly lax and not well supported, but there was no descent of the cervix and no protrusion of the vaginal walls when the patient strained. About a month ago I heard from her doctor that the patient had died recently from pulmonary tuberculosis.

The case presents many curious features and a diligent search has revealed no similar case in the literature. Here we find almost instantaneous swelling and descent of the cervix following immediately on an extremely precipitate labour, under conditions entirely precluding the possibility of prolonged pressure on the cervix between the presenting part and the pelvic brim. Moreover, there had been no previous descent or protrusion of the cervix uteri during the pregnancy or before it, nor had the conditions arisen in previous labours, while the most striking feature of all is the complete return of the cervix to the normal state without resultant hypertrophy or prolapse.

It has been possible to collect reports, published during the past fifty years, on thirty cases of acute œdema of the cervix occurring during pregnancy, labour and the puerperium. Some ten or twenty other reported cases are so obviously of a totally different condition that I have not included them, confining myself strictly to the cases in which the swelling has been a true "acute œdema." Of these thirty cases, twenty-four occurred before labour at various periods of pregnancy, four during labour and two immediately after delivery. Only four were in primiparæ, the remainder being in multiparæ from two to seven para., the ages varying from 18 to 43 years. In those occurring before labour the first appearance of œdema varied from between the first month (Sequin[2]) and full time, the majority being between the fourth and eighth months of pregnancy. In six cases the condition recurred in successive pregnancies [Gueniot[1] (2), Geyl[3], Paddock[6], Rouvier[8], and Sauvage[14]], while in ten of the cases it appeared at different periods of the same pregnancy, [Geyl (7 cases), Jolly[4], Varnier[15] and Paddock[6]]. In fourteen cases labour went to term and was normal; in five, labour was brought on prematurely by the œdema, and in seven cases, operative interference was deemed necessary. Of these seven cases only three appear to have been true cases of acute œdema; two were delivered easily by the forceps applied inside the cervix, while in the third case the cervix was amputated before labour on account of acute gangrene in the projecting portion (Turenne[13]). Turenne also quotes twenty other cases in which operative measures were resorted to, but in these cases the condition was one due to chronic cervical disease obstructing delivery, and was not the typical picture of acute œdema. In only one case was there a fatal result from the œdema, that of Turenne in which gangrene supervened.

The characteristic features of the condition were as follows:— The swelling usually lasted only for a short time varying from a few hours to a few days, usually disappeared in the *decubitus* with or without manipulation or applications, and only in three cases (Misrachi[16], Geyl[3], Turenne[13]) was the mass irreducible, failure in two of these cases probably being due to the fact that labour pains had commenced. The symptoms in all were somewhat similar and seldom severe, namely—moderate pain or sometimes merely discomfort in the vulva and the projecting mass, dragging pain in the lumbar region and groins, and, in five cases collected by Geyl, retention of urine due to dragging down of the anterior vaginal wall was the most distressing feature. This symptom is not mentioned in any of the cases recorded by other writers but probably was present in several; in my case there had not been sufficient time for retention to

develop. The size of the swelling varied from that of a plum to a fist or even larger, was tense and somewhat elastic, only pitted slightly, if at all, on pressure, and the colour was usually dark red. Of the ten cases collected by Geyl two patients were phthisical, one had an ovarian cyst and seven appeared healthy. In the other recorded cases no mention is made of the general condition of the patients though Seitz[3] attributed the œdema in his case to severe constipation. In four of the cases recorded by Geyl the œdema was confined to the anterior lip, the same being found by Rouvier in two cases, and by Haultain,[11] Seitz and McKinnon.[12]

The condition was first described by Gueniot who, in 1872, published an account of four cases he had seen, and two he was able to collect from other sources, but Geyl was the first to investigate the subject fully, and in 1894, published ten cases he had been able to collect from the literature, including those of Gueniot, and two of his own. In 1904, Rudolf Jolly published one case and discussed the etiology of the condition very fully, also reviewing the previous literature, particularly that of Geyl. Seitz, in 1905, described an unusual case in which the condition was attributed to recurrent severe constipation and since then isolated cases have, from time to time, been recorded. From the beginning there has been a failure to distinguish between cervical hypertrophy, prolapse and true acute œdema, and no distinction had been made between idiopathic cases and those in which trauma was undoubtedly a factor. It was not until 1925 that Turenne, in an excellent paper on the subject, recognized the existence of different types of the condition and attempted their classification, though it is unfortunate that most of his work was devoted to that type in which labour was obstructed by the cervix, in reality not a true acute œdema.

The outstanding features in the condition are (1) Sudden onset often following slight strain or labour. The cause in those cases following labour is not the same as in the cases occurring during pregnancy, but the symptoms and signs are similar and the œdema behaves similarly in each case. (2) A tendency for the œdema to subside in the *decubitus*. (3) A tendency for the œdema to recur during pregnancy and often at the commencement of labour. (4) Comparative mildness of symptoms. (5) The absence of any permanent cervical change. (6) The absence of any marked influence on pregnancy or labour.

The etiology is still very obscure and many theories have been propounded to explain the appearance of this sudden and acute œdema in pregnancy and labour. I say "sudden and acute" to

distinguish it from the more chronic form of cervical œdema with which it has often been confused and which is by no means rare. Gueniot contends that the œdema is secondary to cervical hypertrophy or prolapse—he fails to distinguish between these two conditions—and takes this as an essential feature in all cases. Geyl attacks this theory vigorously, pointing out, rightly, that in many cases there is no previous history of prolapse or cervical hypertrophy and that frequently neither of these conditions was present when the œdema had subsided. He maintains that the œdema is due to a mechanical cause, namely, kinking at the junction of the lower uterine segment and the cervix, brought about by the forward tilt of the body of the uterus, aided by an increase in intra-abdominal pressure during pregnancy. This, he maintains, impedes the venous and lymphatic return from the cervix, and stasis in the cervical capillaries and lymphatics leads to an outpouring of lymph with subsequent œdema. Jolly does not accept this explanation, on the ground that no kink is demonstrable, that often the anterior lip only is effected, and that the condition may be intermittent. He analyzes the various known causes of œdema and accepts as the cause of this acute cervical œdema, an increase in the capillary secretions in the nature of an inflammatory œdema. To quote:—"The acute œdema of the cervix is therefore to be reckoned among the inflammatory œdemas which can be caused by infectious, toxic, thermal, traumatic or ischæmic influences. Such œdemas are described by Quincke as angio-neurotic." Seitz maintains that the cause is mechanical and cites a case in which the "tumour" appeared at the eighth month and the patient, a multipara, thinking herself in labour, summoned a midwife who punctured it, thinking it to be the membranes. The patient almost bled to death before the bleeding could be controlled by pressure, and the nature of the condition diagnosed. Examination showed the rectum to be distended by a large fæcal mass, the bowels not having been moved for a week, and after the rectum had been evacuated the œdema disappeared. The patient returned home later, but again allowed the rectum to become loaded, with the result that the œdema suddenly reappeared and only subsided after a thorough emptying of the lower bowel. Knoop[9] also maintains that the cause is mechanical, and cites a case in which œdema occurred after application of a tight binder following external version, and disappeared on removal of the binder. Zweifel[10] attributes the œdema in his case to old cicatrisation of the cervix with resultant venous congestion, and Haultain,[11] while favouring Geyl's theory of mechanical causation, does not abandon the possibility of a toxæmic cause.

Turenne, in the best review on the subject, was the first to

recognize varying types of the conditions with different causes. He describes three distinct types:—

(1) An acute œdematous type in a cervix previously intact, with sudden onset and tendency to recur; it is easily reduced and has little influence on the course of pregnancy and labour, and the cervix becomes normal after labour.

(2) The cervical hypertrophy type, infra-vaginal and supra-vaginal, or both, previous to pregnancy. In this type the œdema is insignificant during pregnancy and has little or no influence on the course of labour, save for a tendency to prolong it.

(3) The mixed type, chronic œdema with acute pressure in a cervix previously diseased. This type is characterized by its tendency to cause dystocia.

He quotes cases collected from the literature in support of each, and describes two of his own cases as being in Class II. This is a great advance on previous treatises in which conflicting views were the result of failure to recognize a diversity of types, but fails to classify completely all the cases. Class I certainly includes most of the cases, but there are many cases recorded in which there has been previous cervical hypertrophy either congenital or acquired, and in which the œdema has been severe. According to Turenne these would not be included in Class II when the œdema is insignificant, they are not included in Class III in which the cases are not true acute œdema, so no provision is made for a group which constitutes a large proportion of the total number. Accordingly, I have grouped the cases rather differently, though it is impossible to prevent a certain degree of overlapping, and it is impossible to separate cases in which trauma is the predominant factor from those in which other influences would seem to be at work.

The following classification, based on the conditions of the cervix prior to pregnancy, appears to cover all the cases.

(*a*). *Acute œdema in a cervix previously the seat of congenital hypertrophy*, that is when the vaginal portion of the cervix has been abnormally elongated prior to pregnancy. This group includes most of the cases found in primiparæ, but also may affect multiparæ since congenital elongation of the cervix not only persists after pregnancy, but even tends to become accentuated by it unless operative shortening is resorted to. The acute œdema may occur during pregnancy or labour, occasionally both, as a long cervix during pregnancy is more liable to trauma in labour on account of its length and size, and the characteristic feature of this group

is the finding of an abnormally long cervix before or after the appearance of the œdema.

Long cervix before or after the appearance of the œdema. A typical case in this group is that of Rizzatti, quoted by Turenne, in which a pregnant woman, aged 22, had retention of urine due to retroversion of the uterus, the cervix of which was hypertrophied, œdematous and projecting from the vulva. The retroversion being corrected, the œdema disappeared. The child was delivered at term with the forceps, the cervix dilating easily. The cause of the œdema was probably mechanical; the cervix being longer than normal could not remain in the long axis of the uterus when the body was retroverted and so an acute kink was produced at the junction of the neck and body of the uterus, thus constricting the afferent vessels and lymphatics. Retroversion with congenital hypertrophy of the cervix is extremely rare.

(*b*). *Acute œdema in a cervix previously normal.* The onset is sudden and may be during pregnancy when there is a tendency to recurrent attacks, or during, or immediately after, labour. This type is characterized by the complete return of the cervix to the normal state after the œdema has subsided. Typical cases in this group are those recorded by Gueniot, Haultain, Paddock, Jolly, Rouvier.

(*c*). *Acute œdema in a cervix previously hypertrophied*, either in the vaginal or supra-vaginal portion, or both. It is never associated with any marked degree of prolapse, though a slight degree may be present. This group includes those cases of acute cervical œdema which have been confused with cervical hypertrophy and prolapse by previous writers. The œdema, when present, accentuates an already existing pathological lesion, and when it subsides, this pathological condition of cervical hypertrophy and slight prolapse remains. It differs from group A in that it does not occur in primiparæ, that the supra-vaginal cervix is hypertrophied and sometimes a moderate degree of prolapse is present. Acute œdema has never been recorded in any case with marked uterine prolapse; probably the extreme laxity of the peri-cervical tissues mitigates against its occurrence, and moreover, the continuation of pregnancy to term in such cases is rare. A typical case in this group is the second case recorded by Turenne.

To find a cause for all these cases of sudden œdema with disappearance almost as sudden is extremely difficult. The mechanical theory put forward by Geyl does not explain cases in which one lip only is affected, nor why the condition is so intermittent. Moreover, the forward tilt of the uterus is present during pregnancy in many multiparous women yet acute cervical œdema is rare. Constipation during pregnancy is the rule rather than the exception,

so little support can be found for the theory of Seitz, and the application of a tight binder has only on one occasion been followed by acute cervical œdema (Knoop). Jolly's theory of an angioneurotic œdema is even less satisfactory, for no general cause could produce so localized an œdema, nor would it be of such short duration. Probably several causes are at work in its production, chiefly mechanical, and while no one of these by itself can produce the typical picture, a combination may do so. Thus, in a patient with a tendency to œdema from causes to be enumerated later, slight strain, such as coughing or falling as mentioned in many of the cases, or the application of a tight binder, may be the deciding factor.

In a fair proportion of the cases, trauma is almost certainly the chief factor. In the case I have described and a somewhat similar one described by Haultain and which I recorded, labour was, in the one case, precipitate, and in the other occupied only four hours following induction by quinine and pituitrin. In both cases there was probably considerable laceration of the junction between uterine body and cervix with tearing or temporary obliteration of the blood vessels and lymphatics. The arteries having thick walls, would tend to escape injury while the thin walled efferent veins and lymphatics would be torn, thus the inflow of blood would be unimpaired but the venous and lymphatic return much impeded, leading to rapid outpouring of fluid with consequent rapid increase in size of the cervix. With descent of the cervix through the vulva, a vicious circle is established with still further increase in the œdema, the condition now approaching strangulation. One would expect more trauma anteriorly between the presenting head and the broad pubic arch than between the head and small promontory behind, and this is substantiated by Haultain's case and Rouvier's two cases, in which the anterior cervical lip was chiefly affected. The rarity of the condition makes one wonder if some other factor must be present, for precipitate labour is not rare, but it seldom produces acute œdema of the cervix. In my own case and two cases recorded by Geyl there was toxæmia from chronic phthisis, so it is probable that trauma may have been combined with an inherent tendency to œdema in these patients, either from alteration in the body fluids or the vessel-walls, or both, such a tendency to œdema being commonly exhibited by tuberculous patients as shown by such a phenomenon as the *tache cérébrale*. Those cases occurring during pregnancy are almost inexplicable. Almost all are in multiparæ, so Geyl's theory of a pendulous abdomen and kinking of the lower uterine segment is possibly true. Added to this, one may consider the effect of gravity in the organ, extremely vascular, in which the lowest part is small and the upper part very

large in comparison, so that any downward accumulation of fluid would tend to gravitate into the cervix. Any form of general toxæmia, such as tuberculosis, might cause a tendency to such œdema. The culminating factor causing protrusion of the cervix and subsequent progressive œdema may then be some slight strain such as coughing, a fall or mounting a bus, as recorded in many of the cases, or possibly a sudden change in the attitude or position of the fœtus *in utero*, allowing a sudden change in the relations of the lower uterine segment to adjoining structures. I think that in many cases the suddenness of the onset in those cases occurring during pregnancy has been overestimated; probably the first increase in size of the cervix is gradual but the cervix remains within the vagina and the patient is quite unconscious of the swelling. Then, suddeuly, if there is some laxity of the uterine supports, with some slight strain, the whole is pushed through the vulva, the bladder and the urethra are pulled upon, and a vicious circle is set up which tends to a still greater constriction above, and rapid increase in the œdema below. Consequently, the acute picture is one of extreme rapidity, though the œdema itself may have been present, in lesser degree, for some time.

Therapeutically, treatment must be directed towards early reposition of the mass, in view, firstly of the possibility of gangrene, and secondly of contamination and infection of the cervix. It should first be cleaned by a stream of warm mild antiseptic, if necessary it should be firmly compressed, and then gradually pushed back into the vagina. In the event of failure, a second attempt, with elevation of the hips, might be successful. It should then be kept in position by a pad supported by a perineal pad and bandage. From the published accounts, success is possible in practically all cases occurring during pregnancy and after delivery. If the case occurs during labour and reduction is impossible, manual dilatation or incision with immediate delivery would probably be the best course, since gangrene or septic infection would certainly prove fatal.

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Observations on the Indications for the Induction of Labour.

By P. Connan, B.A., M.R.C.P., (Lond.) and R. Owen-Jones, M.B., B.S., (Lond.)

During our term of office as Resident Medical Officers at the City of London Maternity Hospital Mr. Eardley Holland suggested that we should investigate the hospital case-records in order to test his belief that induction of labour for pelvic contraction and for post-maturity was being practised with unnecessary frequency.

We have, therefore, collected the records of all the cases induced either for contracted pelvis or for post-maturity at the City of London Maternity Hospital during the five years 1921—1925 inclusive; a total of 123 cases of contracted pelvis and 82 cases of post-maturity. These are the only cases that have occurred in over 8,000 labours conducted at the hospital during these five years. It will be seen, therefore, that induction of labour is not resorted to with unusual frequency. It appears, however, from the following figures that in 63 per cent. of the cases in which labour was induced for contracted pelvis, the operation was performed either too early or need not have been performed at all, and that in 61 per cent. of the cases in which labour was induced for post-maturity the operation was performed too early.

Indications for The Induction of Labour in Cases of Contracted Pelvis.

All the patients have their pelvic measurements taken in the ante-natal department, and if the measurements or the past history suggest pelvic contraction, a careful estimation of the diagonal conjugate and of the relative size of the fœtal head to the pelvic brim is made, under an anæsthetic if necessary. In any case in which it is found that under anæsthesia the fœtal head cannot be pressed into the mother's pelvis, induction of labour is proceeded with. In addition, labour is induced in any primigravida in which the fœtal head has not become engaged by the 38th week, or in which the fœtal head has been engaged at the 38th week, but later has risen above the brim. No record has been kept of the amount of overlapping of the fœtal skull found in the ante-natal department, and all such cases are called contracted pelvis in this paper.

Criteria for Judging The Nature of The Second Stage of Labour.

For the purpose of this paper, a second stage of labour of less than one hour has been considered short and the labour easy; a second stage of labour of from one to two hours has been considered normal, although some of them have been marked "easy" in the labour ward notes, if the forceps has not been used to aid delivery; any case in which the second stage of labour lasted over two hours has been classed as long and difficult, and so have all cases in which the forceps have been used. It is obviously impossible to say definitely when the second stage of labour begins in any case, and for this information we have relied entirely on the labour-ward sisters, women of vast experience. In a few cases, four in the first series and two in the second series, no time limit has been fixed to the first stage of labour, and the first and second stages of labour have been given together.

The number of cases delivered with the forceps is higher than normal, owing to the fact that the forceps is also applied solely for purposes of instruction.

Results.

In the majority of cases in which labour was induced for contracted pelvis the second stage of labour was very short. Of the 78 cases in which the second stage of labour was less than one hour, only 11 were induced before the 38th week, and we think it can safely be said that the remainder would have delivered themselves fairly easily at term without the aid of the forceps. Of the 11 cases in which labour was induced before the 38th week, three were induced at the 36th week. The infants weighed respectively 4 pounds 7 ounces, 5 pounds 3 ounces, and 4 pounds 7 ounces and the second stages of labour lasted five minutes, 15 minutes and three minutes respectively. These three infants were born alive, and were alive when discharged from hospital, but they were so puny that it is very problematical whether they lived till the end of a year. These three infants could safely have been left some time longer *in utero;* the mothers would still have had easy labours and the infants would have had a much better chance of weathering the storms of the first year of extra-uterine existence.

Labour was induced in the remaining eight at the 37th week, and if this had been deferred for another two weeks, the mothers would still, we think, have had normal labours.

In 26 cases the second stage of labour lasted between one and two hours, and of these five were delivered with the forceps. In

only one instance was the reason for the use of the forceps given in the notes, and that was for purposes of instruction. One other infant which was delivered with the forceps following induction of labour at the 36th week, weighed only 4 pounds 12 ounces. This infant would almost certainly have been born without the aid of the forceps. In the remaining three cases the infants were probably also delivered with the forceps for instruction as no cause for instrumentation is mentioned in the notes.

In 15 cases the second stage of labour lasted more than two hours, and of these eight were delivered with the forceps.

Induction of labour was probably necessary in some of these 41 cases, and in some of the 15 cases in which the second stage lasted two hours or more, labour might, with advantage, have been induced from one to two weeks earlier. Two infants were post-mature, and labour in these cases should certainly have been induced at or before term.

Of the remaining four cases in which the first and second stages of labour were not differentiated, in three the labours were long, and in two of them the use of the forceps was necessary to aid delivery. The fourth patient had a normal labour. In these four cases also induction of labour was necessary.

Dead Births.

Among these 123 deliveries there were nine dead-births. In three cases death took place before labour, and of the remaining six (intra-natal) deaths, three were associated with delivery with the forceps. No records of post mortem examinations were available, so the precise cause of death is unknown. Of the three dead-births delivered spontaneously, one was the result of an easy labour, and the life of the infant would probably not have been saved by earlier induction. The other two infants, together with the three delivered with the forceps, might have been saved by earlier induction.

Indications for Induction of Labour in Cases of Post-Maturity.

Post-maturity alone accounted for 82 of the inductions of labour. It has been the custom at the City of London Maternity Hospital to induce labour for post-maturity because the estimated period of pregnancy was over 40 weeks and not on account of any disproportion between the size of the fœtal head and the maternal pelvis. Before the birth of the child the only evidences of post-maturity are the *data* of the last menstrual period, and the height of the fundus above the symphysis pubis, and both these

factors are extremely fallacious. For example, not only can one but seldom obtain precise information about the insemination date, but even if this is obtained, one still does not know and never can know, the insemination-fertilization interval, nor does one know the exact duration of the normal pregnancy. Again, from the fifth month onwards, the height of the fundus may be increased by hydramnios or multiple pregnancy, or diminished by oligohydramnios.

Judging by the weights of the infants alone, it would appear that many of them were not post-mature. But, as was shown by Ballantyne and Browne,[1] weight alone cannot be relied upon as an index of post-maturity. We have not given the fœtal lengths because they are equally fallacious, and the margin of error in measurement is too great, if not carried out by the same person. No records of the skin and appendages were kept, nor was it possible to take X-ray photographs of the ossification centres. Consequently, from a study of the records of the infants, we were unable to say which of the above cases were, or were not, post-mature. However, from the obstetric point of view, the only *data* of any value are the date of the last menstrual period and the size of the uterus, and from these two the obstetrician has to calculate the date of the expected confinement. This has been done, and from the results it is obvious that, as regards the course of labour, many cases need not have been induced when they were.

We agree with Ballantyne and Browne that, "there is no proof that if the weight of the post-mature baby is near the average (as it sometimes is) the labour will be more dangerous than usual; in other words, post-maturity itself, apart from large dimensions of the fœtus, does not appear to be a cause of still-birth"; and again, "the danger is concentrated in the intra-natal period when the child is passing, or rather is being dragged through, the genital canal of the mother. The child dies in its birth or soon afterwards, on account of injuries received therein."

Hence it follows that, from the fœtal point of view, at any rate, the only indication for induction in a case of post-maturity, must be disproportion between the head and the pelvis. But with what follows in the above quoted paper we cannot agree. Theoretically perhaps the mere prolongation of pregnancy may cause trouble in the mother, but we have no clinical proof that such is the case, and a prolonged pregnancy does not appear to be more liable to become morbid than does a normal pregnancy. Again Ballantyne and Browne say that the mother knows that the baby ought to have arrived, and worries because it does not arrive, a worry which is intensified if the mother goes through a spurious labour. In none of the 82 cases here collected, was

there any record made of a spurious labour, and with a little care and tact, the mother can be put at her ease by explaining that pregnancy is often prolonged, and that as long as the child is not too large, neither the mother nor the child is running any increased risk.

We think that the only indication for the induction of labour in post-mature cases, but that a very real one, is disproportion between the head of the child and the pelvis of the mother.

Results.

As we have stated before, induction of post-mature labour has not been performed on account of this disproportion, and consequently we find a large proportion of easy labours. The second stage of labour lasted less than one hour in 50 out of the 82 cases.

From the point of view of the labour, these pregnancies could have been allowed to continue for some time longer without greatly adding to the difficulty of the labour. Many of them would probably have started labour spontaneously, and in this way any chance of induction of premature labour would have been avoided.

For example, in 14 out of the series of 82 cases, the fœtus weighed less than 6 pounds at birth, and it is doubtful whether they were post-mature, although according to the dates of the last menstrual periods, they were all post-mature.

The second stage lasted from one to two hours in 15 cases, and of these, one was delivered with the forceps for purposes of instruction.

The second stage lasted over two hours in 15 cases, and of these seven were delivered with the forceps and one required perforation.

These 30 cases, although induced for post-maturity *per se*, needed induction for impending disproportion, and in some among those in which labour lasted over two hours in the second stage, induction should have been resorted to earlier.

Nevertheless, in the 52 cases in which the second stage of labour lasted less than one hour, it would appear that there was unjustifiable interference with what is, after all, a normal physiological process.

During the last four months, since the commencement of this investigation, the practice of induction of labour has been much reduced at the hospital.

There has not been any increased frequency of difficult labours, injury to birth canal, or intracranial injury to the fœtus from

excessive moulding. In cases of slight disproportion more reliance has been placed in the power of the uterus and in moulding of the fœtal head, and in cases of so-called post-maturity without disproportion less faith has been placed in the accuracy of the date the mother gave as that of her last period.

Even during this short period of four months our contention, that the induction of labour is quite unnecessary in the majority of cases, has been borne out.

Some further interesting features, arising out of this series of cases, are worthy of note. During the last three years, in nearly all the cases in which labour was induced an attempt was made to start labour with the "castor oil, quinine and pituitrin" method, and only after two consecutive attempts had failed, was any operative procedure resorted to. We realize that the numbers are small, but we give the results for what they are worth. In 36 cases of post-maturity the castor oil, quinine and pituitrin method of starting labour was employed and of these 24 *i.e.* 66 per cent. started labour without any operative procedure. In 67 cases in which labour was induced for contracted pelvis the castor oil, quinine, and pituitrin method was employed and of these 31,*i.e.* 46 per cent., started labour without any operative procedure. It appears, therefore, that the figures given in Eden and Holland's[2] "Manual of Midwifery," i.e. 90 per cent. and 70 per cent. respectively when compared with our cases are appreciably too high. In those cases in which operative procedures were resorted to, either bougies or a stomach-tube were inserted, and very rarely, when these failed, a small hydrostatic dilator was inserted.

Also we had for some time been under the impression that the infants of those mothers to whom castor oil, quinine and pituitrin had been given for the purposes of inducing labour, did not progress during their stay in hospital as satisfactorily as others whose mothers had not had this treatment. Again we must mention the possibility of the fallacy of small numbers, and therefore our conclusions are open to criticism. Out of the 123 cases of induction for contracted pelvis, 67 were attempted with castor oil, quinine and pituitrin, and of these 18 infants, *i.e.* 26.9 per cent. regained their birth weight before leaving hospital, whereas of the 56 cases induced without these drugs, 22 *i.e.* 39.3 per cent. regained their birth weight. In those cases in which labour was induced by castor oil, quinine and pituitrin, the average amount under birth weight on discharge from hospital was 5.7 ounces whereas, when these drugs were not used, the average loss was only 5 ounces.

Out of the 82 cases of post-maturity, in 36 labour was induced with castor oil, quinine and pituitrin, and of these 6, *i.e.*, 16.7 per

cent., of the infants regained their birth weight before leaving hospital, whereas of the 46 induced without these drugs 13, *i.e.* 28.26 per cent., regained their birth weight. In those cases in which labour was induced by castor oil, quinine and pituitrin the average amount under birth weight on discharge was 6.8 ounces, whereas in those in which drugs were not used, it was again only 5 ounces. These figures tend to confirm our impression.

Follow up.

We have endeavoured to follow up all the cases from the records of which the above conclusions have been arrived at. Only 101 cases could be traced in spite of the very valuable assistance given us by the Medical Officers of Health for the various Boroughs. Of 101 mothers, 25 have become pregnant again, of which 17 were classed as cases of contracted pelvis at the previous pregnancies. These 17 patients all had normal labours. and four are worthy of further mention :—

Case 1. Previous pregnancies; 1st baby alive (instrumental); 2nd baby dead (instrumental); 3rd baby, labour induced at 36th week, 2nd stage 15 minutes; baby weighed 5 pounds 3 ounces at birth.

Subsequent pregnancy. Full time, normal labour; 2nd stage 30 minutes, baby weighed 7 pounds 4 ounces at birth.

Case 2. Previous pregnancy. Labour induced at 38th week; baby weighed 4 pounds 15 ounces at birth.

Subsequent pregnancies. Normal, full time; 7 pounds 12 ounces; 8 pounds 4 ounces.

Case 3. Previous pregnancy. Labour induced for post-maturity. Baby weighed 7 pounds 8 ounces at birth.

Subequent pregnancies. Normal; 9 pounds 8 ounces; 10 pounds; 10 pounds 12 ounces.

Case 4. Cæsarean section was performed subsequently at another hospital. No details were obtainable.

Summary.

Induction of labour for contracted pelvis was unnecessary in 46 per cent. of the cases.

Induction of labour for post-maturity was too early in 61 per cent. of the cases.

The only indication for induction of labour in a case of so-called post-maturity must be disproportion between the head of the child and the pelvis of the mother.

The children of women whose labour is induced with castor oil, quinine and pituitrin do not progress as satisfactorily as those in which labour has not been so induced.

Induction of labour for post-maturity with quinine only, and for contracted pelvis with quinine only was successful in 66 per cent. and 46 per cent. respectively.

In conclusion, we wish to thank the members of the Honorary Medical Staff at the City of London Maternity Hospital for permission to publish these figures, and for kindly criticism and valuable suggestions.

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Melanotic Sacroma of the Clitoris.

Natural Size.

Melanotic Sarcoma of the Clitoris.*

By Frances Ivens, M.B., M.S. (Lond.), Ch.M. (Liverpool).
Clinical Lecturer in Obstetrics and Gynæcology, University of Liverpool.

I believe this case to be one of extreme rarity.

The patient was a widow, 8 para, of about 58, ten years past the menopause, of healthy appearance, but very stout. She had had an operation for gallstones some years previously, and was complaining of hæmorrhoids, on account of which she consulted her doctor. She had noticed a small lump in the anterior portion of the vulva for about twelve months, but it had not given her any pain or inconvenience, nor was there a discharge.

On examination the clitoris was found to be replaced by a softish nodular growth, pigmented in patches, which extended on to the left labium minus. The prepuce of the clitoris was stretched over the tumour. The growth was movable on the deeper structures.

On April 16th, 1925, the whole of the vulva was excised, No enlargement of the inguinal glands could be detected. In addition some large hæmorrhoids were removed.

Primary union took place, and her doctor reports that so far, (*i.e.* 18 months after operation), no recurrence has taken place.

Microscopically the tumour consists of masses of spindle cells with well-stained nuclei arranged in an alveolar manner in a connective tissue stroma. Granules of brownish pigment are scattered through the connective tissue and are present in some of the cells, but in some areas pigment is absent. The tumour is covered by thinned-out stratified epithelium.

Cases of melanotic sarcoma of the clitoris are very rare. In 1908, Eardley Holland collected three among thirty-two melanomata of the vulva.[1] Since then Lockhart[2] has reported one, and mentions two others.

Both authors note the extreme malignancy of these tumours and their tendency to rapid dissemination.

In the case I report, favourable points affecting prognosis are :-

(i) The absence of ulceration and fixation.
(ii) The absence of enlarged inguinal glands,—and possibly
(iii) The fact that pigment only occurs in patches.

*Read at a meeting of the North of England Obstetrical and Gynæcological Society at Sheffield, November 19th, 1926.

As regards the mode of origin of this tumour it is probable that it arises from the chromatophores or connective tissue pigment cells of the skin, and is therefore a melanotic sarcoma.

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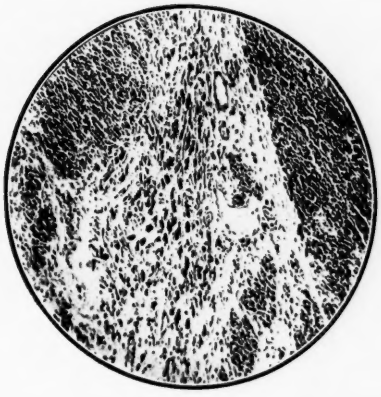
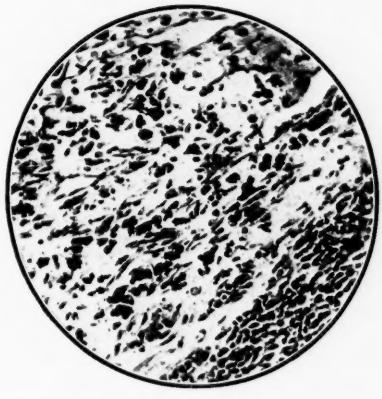


Melanotic Sarcoma of the Clitoris
Low Power.



Melanotic Sarcoma of the Clitoris
High Power.

A Case of Superfœtation.

By James Riddel, M.C., M.D., (Edin.), F.R.C.S.E .
Hon. Assistant Surgeon, South Devon and East Cornwall Hospital, Plymouth.

A young married woman was examined on April 6th, 1926. She complained of pain in the back and of a vaginal discharge. The last menstrual period began on December 15th, 1925. On bimanual examination the uterus presented the signs of pregnancy of three months duration. A month later the uterus had not increased in size. A diagnosis of missed abortion was made. The patient was admitted to hospital in June 1926.

At the operation, two fœtuses were removed from the uterus. The gestation sacs were separate. The first fœtus was of the age of $3\frac{1}{2}$ months, complete with placenta, and was macerated. The second was a fœtus of the age of seven weeks, to all appearances healthy and growing.

Comment.

There was no evidence that the uterus was septate. It cannot be contended that this was a twin pregnancy in which one of the embryos had failed to develop. The larger fœtus had been dead for a considerable time, and the smaller was healthy and growing.

The condition may be explained in the following manner. After the death of the larger fœtus ovulation restarted. A potential space existed between the membranes of the macerating ovum and the uterine wall which allowed of the fertilization and embedding in the uterus of a second ovum. This ovum developed for seven weeks when it was removed.

HOSPITAL REPORTS

Report of the Maternity Department of the Jessop Hospital for Women, Sheffield, for the year 1925.

By Doris Pindar, M.B., Ch.B.

This report has been prepared in accordance with the suggestions made by the "Sub-Committee for the Unification of Maternity Hospital Reports," and we must, at the outset, heartily congratulate Miss Pindar on the way she has compiled it, and the Medical Staff of the Jessop Hospital on being the first to write their report in such a manner. We feel confident that both she and her colleagues on the Honorary Staff will be the first to admit that it displays the work of the Hospital more clearly than past reports. In particular we like the way the table dealing with "Induction of Labour" is drawn up, and would recommend some of those who are about to adopt the sub-committee's recommendation to look at this table. Apparently by a printer's error, the indication for induction of labour has been omitted in case 906, but reference shows that it was for unavoidable hæmorrhage. The table of "Manual Removal of the Placenta" we are frankly cribbing for the future Reports of Queen Charlotte's Hospital.

The report commences by stating that 917 patients have been treated in the wards, 818 being delivered (or admitted immediately after delivery) and 99 being discharged undelivered. The 818 are not divided into "Booked" and "Emergency", but the division is easily arrived at by referring to the "Numerical Summary" and subtracting the twins from the presentations. The 99 discharged and undelivered do not appear to represent 99 "patients", but, partly at any rate, admission and re-admission of the same patient. Thirty-seven patients were admitted, several of them more than once, because they were "thought to be in labour."

The Breech table is good. The cases might perhaps have been grouped according to the complication or method of delivery. Totals at the end of each table of "Booked" and Emergency" cases would look well in this and some of the other tables, together with the percentage mortality of Mothers and Children.

Above the table on Transverse lie it is stated that there were 18 cases, six occurring in "Booked in "cases. In the table itself four "Booked" and 14 "Emergencies" are shown. Of the four "Booked" cases one was the first of twins and version was successfully performed; one was admitted before labour for external version and returned two weeks later and was delivered as a vertex, and the other two were delivered by Cæsarean section for contracted pelvis. One of the Emergency cases died and ten out of the fourteen babies were stillborn or died.

Embryotomy was performed 19 times—decapitation three times and craniotomy 16 times. All but one were emergencies. The booked case is given in detail in the letter press as a specially interesting case.

Four of the mothers died, a mortality rate of 25 per cent. for craniotomy (or 21.1 per cent if decapitation is included) and the morbidity is given as 42.4 per cent. Three cases of Rupture of the Uterus are reported in detail. The first is a case on which Cæsarean section had been performed at a previous pregnancy. On this occasion an attempt was made to induce labour by bougies, this failed but apparently infected the uterus. A bag was then inserted and a later a stillborn child was delivered by the forceps. The placenta remained undelivered until death of the patient six days later. Post mortem the Cæsarean scar was found to be ruptured.

The second case was sent in as an emergency after attempts at delivery by the forceps. Craniotomy was performed followed by cleidotomy. The mother died 10 hours after delivery.

The third case was also an emergency and craniotomy was performed, followed by difficult extraction. Two days later the abdomen was opened and the rupture packed and sutured. The patient made an excellent recovery.

Ante-partum hæmorrhage is clearly shown in tables for Accidental Hæmorrhage and Placenta Prævia. Case 736 was thought to be a placenta prævia, and a Cæsarean section was performed. It was then found to be a case of accidental hæmorrhage, so it does not appear in either table.

Albuminuria and Eclampsia are dealt with in the letter press. These are 224 cases of albuminuria without symptoms (27.4 per cent. of deliveries) and 81 cases of albuminuria with toxic symptoms. Case details of some of the latter would be interesting as apparently none of them developed eclampsia.

The fifteen cases of eclampsia were all emergencies sent in after the fits had started. The routine treatment is fully described, and full and excellent notes are given of each case. There were three deaths, a mortality rate of 20 per cent.

The morbidity is 11.37 per cent. which is low considering that over 23 per cent. of all the cases are emergencies. The causes are well set out in two tables and we note that septic cases which recover are "sapræmia" while those which die are "septicæmia". We shall remember this distinction.

There are 21 maternal deaths, and for the 818 deliveries this represents a mortality rate of 2.56 per cent. But if the cases are separated into "Booked" and "Emergency" we find that of the 664 booked cases, four died, a rate of 0.6 per cent. while of the 154 emergency cases 17 died, a rate of over 11 per cent. These figures should be brought to the notice of Dame Janet Campbell as a striking proof of the enormous value of adequate ante-natal supervision.

The report on babies is quite good, but does not give "underweight" or "premature" babies.

We are very intrigued with the nomenclature of the baby feeding :—

Breast entirely (we get that)	580 cases.
Complementary feeds entirely.	20 ,,
Supplementary feeds entirely.	10 ,,
Breast and then Complementary feeds.	29 ,,
Breast and then Supplementary feeds. (now we're done ! but worse follows ! !).	13 ,,
Breast, then Complementary, and then Breast feeding alone restored.	12 ,,
Complementary or Supplementary feeds and then Breast feeding restored.	7 ,,

and finally three babies have Supplementary and then Complementary feeds" and one baby is "Weaned" ! !

L.C.R.

Rotunda Lying-in Hospital Clinical Report. for the year 1924-1925.

By Gibbon FitzGibbon, M.D., Master; R. M. Corbett, F.R.C.S.I.; N. M. Falkiner, M. B., *Assistants.*

This report follows the usual lines. In the report of the work of the "Extern" Dept., morbidity is discussed in some detail, and an interesting account is given of the "bacteriology" of the cervix in morbid cases. The routine treatment is an injection of 20 cc. of antistreptococcal serum at the onset of pyrexia, followed by daily injections of 20 cc. of Crooke's Collosal Iodine.

There were six deaths on the district and two more patients died after admission to other Institutions, making eight in all,—0.42 per cent. of 1911 deliveries. Sepsis, post-partum hæmorrhage and pneumonia each account for two deaths, and cerebral hæmorrhage and endocarditis one. In one of the cases of post-partum hæmorrhage aid was summoned after the baby was born. The death due to cerebral hæmorrhage occurred in a patient suffering from "Toxæmia of Pregnancy" who was dead on arrival of the extern midwifery students.

In the "Intern" Dept., 1791 patients were delivered and two cases were admitted after delivery suffering from Rupture of the Uterus, one of which recovered.

On pages 5 and 6 of the Report a "Summary of abnormal presentations and result to Infant" is given, and this if set out in a tabular form would be very much easier to follow. As it is it is rather a muddle.

The forceps were applied 132 times=7.4 per cent. of all deliveries. The infant mortality rate for this operation is clearly set out in a table showing the indication for the application of the forceps and the parity of the mothers. For simple delay in the second stage of labour the forceps rate was 3.6 per cent. The application of the forceps in association with the induction of labour shows an infant mortality of 80 per cent. In nine cases the forceps is applied in the "Upper or Middle Straight" (sic) the infant mortality being 22 per cent.

Contracted Pelvis is dealt with in detail in the tables but pelvic measurements being given in centimetres and the babies' weights in pounds and ounces, leads to confusion. Pubiotomy was

performed six times and Craniotomy eight times (only four times for contracted pelvis) all the mothers recovering.

Albuminuria was found in "a marked degree' in 223 women on admission apart from those who suffered from eclampsia or accidental hæmorrhage. In 70 there was "a very marked degree" and in 18 the "urine boiled solid." "The majority of patients were in labour, but quite a number were admitted for treatment before labour." It is a great pity more details are not given since such a very high ratio of "marked degree" of albuminuria reflects on the efficiency of the ante-natal supervision.

There were twelve cases of eclampsia with two deaths. From the notes given, it would appear that at least seven of the patients were under ante-natal supervision and were admitted for treatment before the onset of fits. Not more than two patients appear to have been sent to the hospital as emergencies by an outside doctor. In the absence of more data one concludes that albuminuria is not recognized and therefore not treated early enough.

The morbidity rate is low, being only 5.4 per cent. Some interesting cases are described in detail, and there is a resumé of the bacteriological investigations which have been undertaken.

There is a discrepancy in the mortality. In Table IV there are ten, but in the letter press (page 19) and in Table XI there are eleven. The latter appears more correct as it is the table of case details of fatal cases. A case sent in on account of rupture of the uterus, during version for impacted shoulder, is recorded in the Gynæcological report. Only four deaths occurred in patients at term; two are cases of eclampsia and two of Cæsarean section who developed peritonitis. Of the 1791 patients delivered at or about term this represents a mortality-rate as low as 0.22 per cent. The remaining seven deaths were in early pregnancy, due to septic abortion, in three cases (one anæsthetic death), hyperemesis in two cases, acute mania in one case and incarcerated gravid uterus with extensive sloughing of the pelvic viscera in one case, the notes of which are very interesting.

Clinical Report of the School of Midwifery and Gynæcology, University of Hong Kong. for the year ended April 30th, 1926.

By R. E. Tottenham, M.D., D.P.H., F.R.C.P.I,

This report is apparently the result of the first years work of the University Clinic. The "Foreword" appears to be written with the dual object, first of explaining the position of affairs to the reader, and secondly, of getting an unofficial dig at the Government to provide more beds and nurses. Professor Tottenham does not seem very content to make a small beginning.

His description of the "Labour Ward" is vivid, but he does not give the actual size. He says "space is so limited . . . it only accommodates one patient, the nursing staff and medical attendant with comfort in cool weather; while it may so happen that two or even three patients have to be attended in their confinements at the same time in this ward." It sounds as though it must be awful in the hot weather!

He also wants more lying-in beds, and some isolation wards. Was there ever an Obstetric Clinic that didn't?

His next grouse is that the patients will not seek admission with mathematical regularity, and that he cannot persuade them to stay for more than three or four days after delivery,—a difficulty which he naively admits does not appear to exist at the neighbouring Tsan Yeuk Chinese Maternity Hospital.

In the Maternity Department there are 10 beds, and from the work done in the Gynæcological Department it would appear that there are two or three available. There is the Professor, an Assistant and a House Obstetrician, so he cannot complain that the Medical Staff is overworked, although the Nursing Staff is in a very different position. There is one trained sister on day duty and another on night duty. The day sister has the help of one, and sometimes two probationers, but at night the night sister is the "only member of the Nursing Staff in the building" (with three confinements all at once, ten lying-in mothers and their babies, in the hot weather—phew!).

In addition, some (number not stated) "amahs" or "Chinese handywomen" are employed, and three students at a time are attached to the Clinic.

The Clinical Report proper is divided into three sections. The Maternity, the Gynæcological, and the Pathological.

In the Maternity Department there were 463 deliveries and one woman suffering from malignant malaria who died undelivered. Five mothers died, making six deaths in all, a mortality of 1·3 per cent or, excluding the one who died undelivered 1.08 per cent.

Thirty-six cases (7.7 per cent.) were morbid, and of these, 19 had had some obstetric operation.

For the number of patients attended, there has been a fair proportion of abnormal work. Two cases of placenta prævia with one death. Seven cases of eclampsia with two deaths, and one Cæsarean section for traumatic stricture of the vagina.

Some unusual and interesting statistics are given. The average measurements of the pelvis and of the fœtal skull in Chinese patients are given, but the pelvic measurements are in inches, and the fœtal skull measurements in centimetres, so either way the reader must do some arithmetic before comparison with European measurements can be made. Why cannot writers keep to one unit of measurement, or give both? The figures show that the pelvic and cranial measurements of the Chinese women and children are a trifle less than the averages given in English text books.

The duration of labour is elaborately set out in tables showing the percentage of cases in which labour lasted less than six hours, six to 12 hours, 12 to 24 hours and over 24 hours, with somewhat similar tables for the duration of the second and third stages. The average duration of labour appears to be slightly less than over here.

The Gynæcological report is a short summary of 55 operations in the Government Hospital and 23 in Tsan Yeuk Hospital. Three subtotal hysterectomies, and one myomectomy for fibroids, one abdominal (recovered) and one vaginal (died) hysterectomy for carcinoma of the cervix, three operations for ectopic gestation (one death), seven for ovarian cysts, and nine for salpingitis together with fifteen miscellaneous operations constitute the roll of major operations which are considered worthy of case-details.

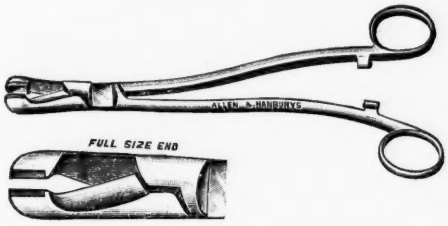
Professor Wang, M.D., B.Sc., D.P.H., D.T.M.H., F.R.C.P, Edin, writes the pathological report, the outstanding feature of which is the suspicious mind of Professor Tottenham Out of a total of 226 specimens sent for examination 171 were blood for Wasserman reaction only, 31 of which were positive. 16 tumours were examined, and we note as an interesting case a "myosarcoma of the cervix." The rest of the specimens consist of blood for culture, urine swabs and smears, and 20 "inflammatory lesions" among which there is one "inflammation of the urethra," and one "inflammation of the heart."

Combined Scissors and Needle Holder for the Operation of Colpo-Perineorrhaphy.

By McKim McCullagh, D.S.O., M.C., M.B., B.Ch. (Belf.) F.R.C.S., (Eng.)

Assistant Surgeon, City of London Maternity Hospital; Assistant Surgeon, Samaritan Free Hospital.

This instrument combines a needle-holder of the Bozeman pattern, and scissors, the latter immediately distal to the joint. The operation of colpo-perineorrhaphy requires the use of many interrupted sutures. I find this instrument, which Messrs. Allen and Hanbury made to my instructions, of great assistance when inserting, tying and cutting the sutures.



Obituary.

William Edward Fothergill.

M.A., B.Sc., M.D., C.M. (Edin.).

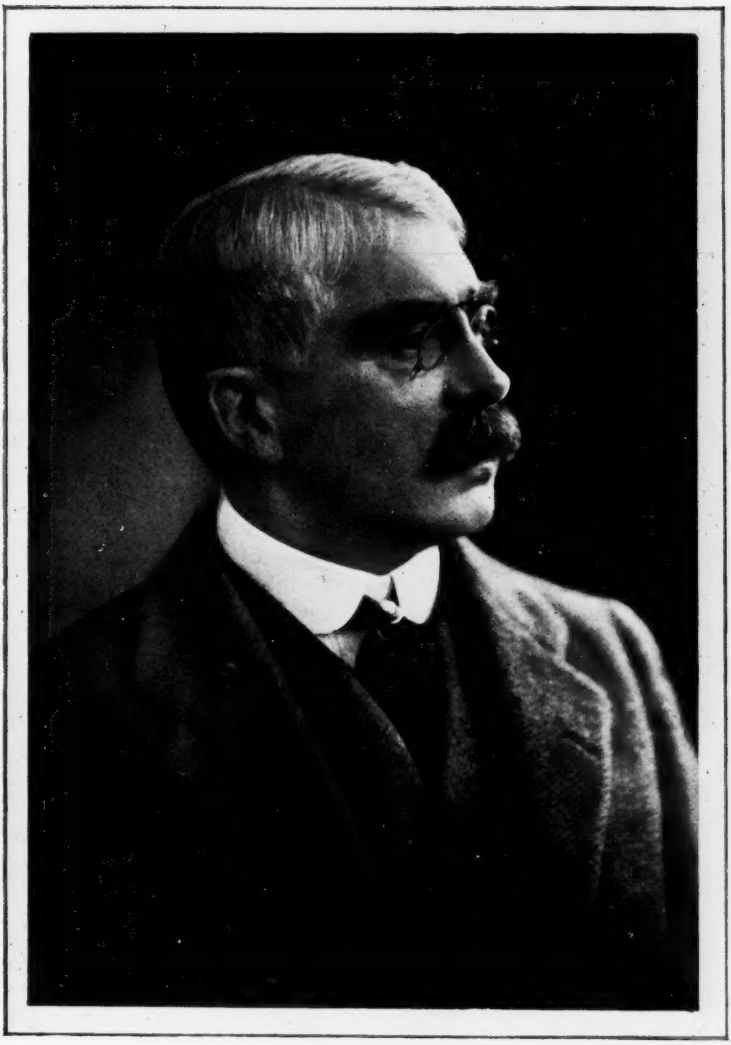
Professor of Clinical Obstetrics and Gynæcology, University of Manchester; Senior Surgeon, St. Mary's Hospitals, Manchester.

The sudden death of "Fothergill of Manchester" on November 4th, 1926, caused widespread grief and regret and a deep feeling of personal loss among all who knew him and his work. He was a man we could ill spare, for he had rare force of character and the power of making his influence felt, and it is no exaggeration to say that there is not another of his day and generation who did more to mould gynæcological opinion in this country.

William Edward Fothergill came of a fine old yeoman stock from the dales and fells of Northern England, and from a family that produced many influential members of the Society of Friends, including the eminent physician and naturalist of the eighteenth century, Dr. John Fothergill, F.R.S., whose life was written by Lettsom, the founder of the Medical Society of London, by Hartley Coleridge in his "Lives of Northern Worthies," and by Kingston Fox in "Dr. Fothergill and his friends."

William Edward was born on October 4th, 1865 in Southampton and brought up in Darlington, where his ancestor, John Fothergill, a grandson of the elder brother of Dr. John Fothergill, had settled and practised as a surgeon. He was educated at the University of Edinburgh, taking, as was then the custom more than is now, degrees in Arts (M.A. 1886) and Science (B.Sc. 1888) before proceeding to graduate in Medicine (M.B., C.M. 1st class Honours 1893). Among the many medals and prizes which fell to him during a distinguished University career, were the Buchanan Scholarship in Midwifery and Gynæcology and one given by the Edinburgh University Club of London for an Essay on "The Relation of Literature, Science and Philosophy in University Education."

After graduation, Fothergill was House Physician and Clinical Assistant to Professor Alexander R. Simpson, first in the Gynæcological Wards of the Royal Infirmary, and later at the Maternity Hospital (1893—95). He obtained his Doctorate in 1897 (with gold medal) by a thesis on "The Ultimate Fate of Placental Tissue retained *in Utero*," and the Milner-Fothergill medal for investigations upon "The Use of the Senecios in Disorders of



UNIV. OF MICH.

Menstruation." Having determined to devote himself to Obstetrics and Gynæcology and finding the prospects of advancement and of establishing a purely consultative practice in Edinburgh were unfavourable, he looked round for some other large centre with a medical school, and received sufficient encouragement to decide to take up special work in Manchester. He settled there in 1895 and, in spite of lack of influence or claims other than those of his own ability, industry and strong personality, quickly made a place for himself, and in a few years became one of the recognized and outstanding representatives of Manchester Gynæcology.

In 1896 he published his "Manual of Midwifery" which proved a popular text-book in Manchester, Edinburgh and elsewhere, reaching its fifth edition in 1922. In 1899 he obtained his first hospital appointments, being elected to the staff of the Northern Hospital for Women and Children, and in the same year being chosen as the first Director of the Clinical Laboratory at the Royal Infirmary for the equipment and organization of which he was responsible. During the six years of this service, a large amount of material pased through his hands and he thereby laid a sound foundation of general pathological knowledge on which to build his clinical experience. During this time he was also responsible for the introduction of radiological work in the Royal Infirmary. Appointed to the staff of the Southern Hospital in 1904, he became, as the result of its amalgamation, one of the staff of the St Mary's Hospitals for Women, where most of his gynæcological work was done. Three years later he was also appointed Assistant Gynæcological Surgeon to the Royal Infirmary, becoming full Surgeon in 1919. In the University he became Lecturer in Obstetrics and Gynæcology in 1901; in 1920, Professor of Systematic and in 1925, Professor of Clinical, Obstetrics anl Gynæcology.

Of Fothergill's work for Manchester it is impossible for one without local knowledge to speak at first hand, though the list of hospital and university appointments he held, and the expressions of regret called forth by his death from academic bodies and professional societies, and from the social and athletic clubs of the University bear witness to his many-sided and public-spirited activities. He was an original and successful teacher, and a good friend to the student, not of the medical side alone, but of all faculties, for he threw himself whole-heartedly into the undergraduate life in the University. He served for several years as President of the Athletic Union, the Football and other clubs, and was a constant attendant at football matches and social gatherings. Familiarly, he was "Bill Fothergill," and at the service of any student that sought his help.

Fothergill's influence on British Gynæcology was a very

decided one because he held strong views and had the power of expressing them emphatically. In the first place, he did more than anyone else in this country to drive home the essential unity of Obstetrics and Gynæcology. The general surgeon who was a successful operator on the female pelvic viscera but ignorant and untrained in midwifery, and often even disdained acquaintance with it, he refused to ackowledge as anything but an amateur and unworthy of admittance to the guild and profession of gynæcologist. A thorough drill in the practice of midwifery was to him the only gateway into gynæcology* and those who tried other modes of entry did but creep and intrude and climb into the fold.

In the next place, his insistence on a pathological classification of the diseases of the female reproductive tract has been of inestimable service in improving the presentation of the subject to the student. His advocacy was largely responsible for getting rid of the old anatomical arrangement with its contracted field of vision and needless repetitions. The missionary work he did in these two directions alone, is enough to make Fothergill's influence on the conception and teaching of his subject, a remarkable one.

In his Manual of Diseases of Women, published in 1910, the diseases were considered in six sections, namely, (1) Errors of Development, (2) Circulatory Changes, (3) Mechanical Conditions and Injuries, (4) Infection, (5) Progressive and (6) Retrogressive Conditions. The book itself was notable both because of its arrangement and of its breadth of view, and was a highly original addition to the textbooks on the subject. It was, however, too much in advance of its time to be a great success, only one revised edition being published, and that not until 1922. It is a curious contrast and an instance of the hazards of leaving the beaten track, that this book of his maturer years should have been less successful than his Midwifery, which was written in his first year in Manchester and with little more experience behind it than that gained during his service in the Edinburgh Royal Maternity Hospital.

In the practice of Gynæcology, Fothergill's name will chiefly be associated with his modification and advocacy of the plastic vaginal operations for the cure of prolapse as worked out in Manchester. Donald began but Fothergill developed these procedures as for instance, by combining anterior colporrhaphy with amputation of the cervix in one operation—and more than any other representative of that school, deserves the credit of

*". . . .no one who has not in one way or another become a good obstetrician can ever hope to comprehend the Diseases of Women" (Introduction to his Manual of Diseases of Women)

having secured a wide acceptance of its methods.* He fought for it with tongue and pen in his own strenuous way and made it his own. Those who attended the meeting of the British Congress of Obstetrics and Gynæcology at Birmingham in 1921, when the figures of the after-results from Manchester were given and Fothergill poured the vials of his scorn on those who still practised abdominal fixation-operations on the uterus, may recollect a characteristic and effective retort he made. One speaker had pleaded for the retention of uterine fixation as a useful addition to the vaginal operations, on the insecure ground that "there were other ways of killing a dog than hanging it." Fothergill seized on the phrase, and turned it against his opponent. His reply was to the effect that it was not a case of other ways of killing a dog than hanging, but of first having killed the dog and then trying to inflict further punishment on it by hanging. It is impossible to recapture the atmosphere of that meeting, but the retort was so exactly to the point and so wittily expressed that it was noisily appreciated by every one present. He was clearly the dominating personality of that session.

He also led the Manchester brigade in an attack on vaginal plugging in the treatment of antepartum hæmorrhage, because of the danger of sepsis and the difficulty of plugging sufficiently firmly to be effective, especially in the ordinary conditions of midwifery practice. At the first Congress in London in 1920, there was a striking passage of arms on this question between the Dublin and Manchester Schools, with Tweedy and Fothergill as the protagonists on the two sides.

Reference may also be made to a characteristic paper, that on "Puerperal Pelvic Infection" in the *British Medical Journal*, for May 3rd 1924, as it illustrates his abhorrence of notifications and the methods of the local health bureaucracy and contains an indignant protest against puerperal fever being included with measles and small-pox as a "catching fever." "Not long ago a medical officer of health objected to the removal of a case of puerperal pelvic infection to a hospital in a cab, because the cab was a public conveyance!"—was his scornful interjection.

Fothergill's strongest weapon in discussion and exposition was his faculty of appreciating the crucial point and summing it up in a few words or by an apt simile. The first time I heard him speak was at the discussion on Teacher's paper on Chorion-epithelioma at the old Obstetrical Society in 1903 and some expressions of his have remained firmly in my mind to this day. They were made in reference to the similarity between the growths

Trans. Obstet. Soc., London, 1903, xlv, 299.

arising from a pregnancy and those from an embryoma, and though as set down for publication they have lost something of their original raciness, they deserve quotation.*

> "It was clear that a mother fatally invaded by the trophoblast of her own child would be a person of one generation killed by a tumour belonging to a person of the next generation—matricide, in fact. But a man slain by an embryoma in his testis would be a victim not of his own child, but of a potential brother or sister—a case of fratricide,—a very different matter, and one worthy of a different name. It was easy to say that an individual had a trophoblast, be he your child or your brother, but the statement would not be easy to prove. We were aware that a trophoblast was essential to the implantation *in utero* of certain mammalian ova, but who would say that chorion was essential in the development of a dermoid cyst?"

He took an active part in founding and maintained a deep interest in this Journal as almost every volume must bear witness, and was a frequent contributor to the medical press.

In private life he was a delightful host and a most welcome guest. He had a keen sense of humour and a fund of anecdote that made him good company at any gathering. He was much in request as an after-dinner speaker, and it was immediately following his speech at the dinner of the Glasgow University Club, that he was seized with his sudden and fatal illness.

Fothergill was married at the start of his work in Manchester, to Edith, daughter of the late J. Dillon Woon, of Chelsea, and had her aid and guidance throughout the early struggle of the difficult days before his position was established. She was an artist like himself, and of like tastes, and the two enjoyed many holidays tramping the country and sketching in the Lakes or Yorkshire Dales, especially in Teesdale where the High Force was a greatly favoured resort. The loss of her help and companionship, in 1920, was difficult to bear and saddened his later years. Her sister, Miss Mary Woon, was able to soften the blow, and to her the sympathy of us all is sincerely accorded.

JOHN S. FAIRBAIRN.

British Medical Journal, February 16, 1926.

BOOK REVIEWS.

"The Diseases of Women." By Sir JOHN BLAND-SUTTON and ARTHUR E. GILES. 8th Edition. W. Heinemann & Co.,Ltd. 15/-

The publication of the eighth edition of this well known text book is a sufficient indication of its popularity. Perhaps one could have wished that such men as Sir John Bland-Sutton and Mr. Giles had seen fit to defy entirely the slavery of convention and to give us their personal impressions of women and their diseases rather as they occur in real life than in the condensed atmosphere of the examination hall. It is unfortunate that the commonest gynæcological types should escape mention in the average text book, or at most find scanty reference in a few lines under separate headings. This custom tends in general to mislead the student, by destroying that sense of proportion and probability which is one of the first essentials in forming clinical judgment. Until he has gained considerable practical experience he is apt to believe that every woman with a pelvic pain must have a pyo-salpinx, or similar tangible lesion. For this tendency we cannot hold the authors of gynæcological treatises free from blame. However, the author of a text book is inevitably penalised at the outset by aiming perforce at completion.

Of chief interest in the present edition are the authors' opinions on procedures more recently adopted in gynæcological practice. It is stated in the preface that the value of myomectomy appears to have been overlooked; surely any reference to gynæcological publications of the last few years would have convinced the authors to the contrary. It has even been suggested in various quarters that the claims of myomectomy have been pressed too far.

On page 113 there is expressed a preference for hysteropexy as compared with the round ligament operations in dealing with retroversion. This is a very debatable choice; and we can only feel that the authors have been exceedingly fortunate in their results, as indeed they claim later in the book.

There is a good though brief chapter on the present position of Radiation in gynæcological treatment; that on endocrine therapy is sketchy and somewhat over-optimistic in outlook. The chapter on general treatment attaches too little importance to those psychological factors which play so large a part in the majority of female patients.

With reference to Wertheim's operation, it is asserted that the immediate mortality is high, and that the radical operation is still on trial. This we venture to criticise, believing that the results of operation in cancer of the cervix compare favourably with those obtained in malignant disease of any other part of the body.

The chapter on prognosis is good, although for various reasons actual statistics on this point are apt to be misleading.

We could find no reference to the "endometriomata" or ectopic endometrial tumours, which have recently occupied so much interest on the part of gynæcologists.

The publishers are to be congratulated on the general presentation, type, and illustrations. FRANK COOK.

"Types of Mind and Body" E. MILLER, M.A., M.B., D.P.M. Kegan Paul, Trench, Trubner & Co. 2/6 net.

This is one of the Psyche Miniature Medical Series, which are publications of a size that can be conveniently carried in the pocket for short journeys or odd moments of leisure. This particular volume is a short study of the different types of mankind and the mental variations which tend to accompany each type; and is illustrated from historical characters. It can be described as a literary cocktail, calculated to stimulate the appetite for further research into an altogether interesting subject. It will appeal to all who believe that the proper study of mankind is man.

R. W. G.

"An Atlas of Midwifery" COMYNS BERKELEY, M.A., M.C., M.D. Cantab., F.R.C.P., and GEORGES M. DUPUY, M.D. 248 Figures in the text and X-ray Supplement. Baillière, Tindall and Cox, London, 1926. 7/6

In this book the authors have aimed at presenting within a small compass a set of illustrations sufficiently complete for a proper understanding of those elements of midwifery which lend themselves to pictorial representation. We may say at once that they have succeeded admirably. Mr. Comyns Berkeley has made a judicious selection of the subjects to be illustrated; and Dr. Dupuy, who has probably illustrated more medical books than any other living man, has made the pictures tell the story most clearly. More than 230 of the drawings have been made expressly for this Atlas. Many are decidedly artistic productions; some few fall short of this description, such as Figures 99 to 102, showing abdominal palpation. We doubt whether these illustrations, and Figures 53 to 57, showing different positions of the patient, are really necessary and a subsequent edition of the Atlas would not be the poorer for their omission. Few of the others could be spared, and, as we have said, most of them show a high standard of excellence, especially in view of the fact that the price of the Atlas is only 7/6, and consequently we cannot expect that superfine quality of paper that would undoubtedly do the drawings more justice.

Some illustrations of X-ray photographs of pregnancy are included, and add very much to the interest of the work.

Whilst the Atlas could not take the place of a text-book, and is not intended to do so, we can believe that it would prove of the greatest service to the student, to supplement his reading, and to the practitioner, who could quickly refresh his memory by looking through its pages.

A. E. G.

"Text-Book of Midwifery for Students and Practitioners." By R. W. JOHNSTONE, C.B.E., M.A., M.D., F.R.C.S.E., M.R.C.P.E Fifth Edition with 263 illustrations. Price 15/- net. 1926, London. A. and C. Black Ltd.

The Edinburgh Medical Series published by Messrs. Black comprises several very successful text-books of convenient size, written by acknowledged authorities. The most popular volume of the series appears to be Professor R. W. Johnstone's "Text-book of Midwifery," the fifth edition of which has just been issued.

While undertaking a thorough revision throughout, the author seems to have kept two objects in view, namely, to keep the book abreast of what is sound and reliable in recent work in the theory and practice of obstetrics, and to prevent that almost automatic growth in size which so often accompanies the appearance of successive editions, every effort having been made to retain the concise character of the teaching which has always been so prominent a feature in Professor Johnstone's book.

The greatest alterations in this edition are to found in the sections dealing with the management of labour in contracted pelvis and with the faults in the powers. The illustrations numbering 275 are mostly line drawings which are didactic and helpful rather than artistic, and a reliable index is provided.

For students who are preparing for a qualifying examination, and who prefer a handy volume such as this to one of the several larger text-books in existence, this book is eminently suitable, and to them it can be recommended with the utmost confidence.

F.E.T.

"Edgar's Practice of Obstetrics." By PROF. J. CLIFTON EDGAR, M.D. Revised by NORRIS W. VAUX, M.D. Sixth edition. Price 42/- net. London. Heinemann (Medical Books) Ltd. 1926.

Dr. Clifton Edgar's Practice of Obstetrics has been long and widely known as one of the best and most popular of the text-books of obstetrics. It now appears in its sixth edition under the editorship of Dr. Norris W. Vaux, the original author, Dr. Edgar having relinquished his teaching posts.

The Editor has succeeded in making the work even more desirable both by student and practitioner. Rigid criticism and vigorous pruning have resulted in the disappearance of much obsolete and non-essential matter, with the result that this edition is shorter than the previous one by a considerable number of pages, an example which we would gladly see more editors follow.

Notwithstanding this praiseworthy condensation, much new matter has been incorporated so that the volume has been brought thoroughly well up to date. A brief but satisfactory account of the physiology of the female genital organs is followed by several chapters on physiological pregnancy. It is here stated, however, that the earliest known ovum in an apparently normal condition is that described and figured by Peters in 1899, and no reference is made to the work of Bryce and Teacher. Again, in describing the condition of the blood in pregnancy, no mention

is made of the alteration in the rate of sedimentation of the erythrocytes. On the other hand, prenatal care and hygiene as well as the follow-up of a maternity case are thoroughly discussed. The complications of pregnancy are also considered in detail, the toxæmias in particular being fully presented, much new matter having been added.

Discussion of the mechanism of labour is comprehensively set forth, and stress has been laid on labour, the preparation of cases and after treatment being carefully and clearly described, and due attention has been given to anæsthetics and their methods of administration. The complications of labour and of the puerperium are fully dealt with, and the diagnosis of the position and pelvimetry have been put on a concise basis. Many subjects, among which may be mentioned version, Cæsarean section, rupture of the uterus, forceps and placenta prævia have been virtually re-written. Sepsis, hæmorrhage and blood transfusion are all adequately described, and the essentials of endocrine therapy in relation to obstetrics are briefly stated.

The illustration, 684 in number, are excellent and are well reproduced: they instruct as well as embellish. Two figures, however, illustrate methods of bimanual compression at variance with those usually taught. In one method, only the finger tips of the internal hand occupy the anterior vaginal formix, whilst in the second method the left hand in the shape of a fist is shown introduced into the uterine cavity, the uterus being also grasped by the right hand through the anterior abdominal wall. We pity the fate of a student who described these methods in his examination! A useful list of selected references occupies twelve pages at the end of the book, which is completed by an adequate index, although we were unable to find any reference to bimanual compression in it.

We consider that this edition will fully maintain the usefulness and enhance the popularity of Edgar's Practice.

F. E. T.

Review of Current Literature.

DIRECTOR: FRANK E. TAYLOR,
M.D., B.S. (Lond.), F.R.C.S. (Eng.), M.R.C.P. (Lond.), D.P.H. (Cantab.

THIS Review will contain the lists of contents, and abstracts of the more important articles, from the following journals, with which the "Journal of Obstetrics and Gynæcology of the British Empire" exchanges:—

British.—The Lancet; British Medical Journal.

Canadian.—The Canadian Medical Association Journal; Bulletin Médical de Quebec.

Australian.—Medical Journal of Australia.

South African.—Medical Journal of South Africa.

American.—American Journal of Obstetrics and Gynæcology; The Journal of the American Medical Association; Surgery, Gynæcology and Obstetrics.

French.—La Gynécologie; Gynécologie et Obstétrique; Bulletin de la Société d'Obstétrique et Gynécologie de Paris

Belgian.—Bruxelles-Médical.

Italian.—Annali di Ostetricia e Ginecologia; Archivio di Ostetricia e Ginecologia

German.—Zeitschrift für Geburtshülfe und Gynäkologie; Archiv für Gynäkologie; Zentralblatt für Gynäkologie; Monatsschrift für Geburtshülfe und Gynäkologie: Münchener Medizinische Wochenschrift.

Scandinavian.—Acta Gynecologica Scandinavica.

South American.—Boletin de la Sociedad de Obstetricia y Ginecologia de Bueno-Aires.

It is hoped that the Review of Current Literature will keep the readers of this Journal in touch with current work throughout the world. At the end of each year it is proposed to print an Index of all the subjects contained in the articles of the above journals. Arrangements will also be made to include abstracts of important articles on border-line subjects, such as Physiology, Biology and Biochemistry.

LIST OF ABSTRACTORS.

London: J. LYLE CAMERON, F.R.C.S., DOROTHY N.L. LEVERKUS, M.B., F. E. TAYLOR, F.R.C.S.
Huddersfield: W. E. CROWTHER, M.B.
Leeds: A. GOUGH, F.R.C.S.
Rugby: ROBERT A. HENDRY, F.R.C.S.
Sheffield: W. W. KING, F.R.C.S.
Glasgow: JANE H. FILSHILL, JAMES HENDRY, M.D.
Sydney: T. FARRANRIDGE, M.B.

Lancet.

August 3rd, 1926.

*The health of professional women. L. Fairfield.

August 14th, 1926.

*The examination of the gastric complaints of infants, with some observations as to the value of lactic acid milk in infant feeding. E. Cassie and U. Cox.

*Intra-uterine injection of pure gylcerine. An experimental enquiry into the bacteriological basis for the local treatment of puerperal sepsis and allied conditions by this means. A. Compton.
Acid milk in infant feeding. (Leading article).
The action of pituitary extract on the uterus. (Annotation).

August 21st, 1926.

An improved vulsellum forceps. H. C. Donald.
Menorrhagia. (Leading Article).
Ophthalmia neonatorum. (Annotation).
Tubercle free milk. (Annotation).
The fertility of the tuberculous. (Correspondence).
Over size babies. (Correspondence).

September 4th, 1926.

*An operation for creating an abdominal "shelf" in certain cases of visceroptosis in women. V. Bonney.
More about milk. (Leading article).
The treatment of congenital hypertrophic pyloric stenosis. C. J. K. Hamilton
Nomenclature of abnormal uterine hæmorrhage. W. Blair Bell. (Correspondence).
The treatment of menorrhagia. A. Savill. (Correspondence).

September 11th 1926.

Pasteurisation of milk. R. C. Affleck. (Correspondence).
Nomenclature of abnormal uterine hæmorrhage. B. Whitehouse. Correspondence).

September 25th, 1926.

*A plea for drastic reforms in the teaching and practice of midwifery. G. W. Theobald.
*A case of simultaneous abdominal and tubal pregnancy. M. Sourasky.
Maternal Mortality in the United States. (Leading article).
Pasteurisation of milk. S. G. Moore. (Correspondence).
Castor oil versus saline aperient. T. B. Welch. (Correspondence).

October 2nd, 1926.

Reform in midwifery. A. P. Muritz. (Correspondence).
Pasteurisation of milk. C. G. S. Baronsfeather. (Correspondence).

October 9th, 1926.

Reform in midwifery. A. McAllister and R. H. Paramore. (Correspondence).
The pasteurisation of milk. H. E. Miles. (Correspondence).

October 23rd, 1926.

The pasteurisation of milk. T. McLachlan. (Correspondence).

November 13th, 1926.

*The cancer problem. W. E. Gye.
*The treatment of contracted pelvis when first seen during labour. A. Bourne.
*Pregnancy, hyperpiesia and meningitis. J. L. Lush.
Birth control instruction by public authorities. (Leading article).
William Edward Fothergill, M.D., B.Sc. (Obituary Notice).

November 20th, 1926.
A case of atresia of the vagina. A. A. Gemmell.

November 27th, 1926.
Prolapse and carcinoma. (Annotation).

December 4th, 1926.
*The rationale and technique of combining operation with radium treatment in cancer. W. C. Stevenson.

December 18th, 1926.
Cancer of the uterus. M. Young and C. Stewart.

December 25th, 1926.
Irradiation of milk; its effect on the blood. V. Dawkins and C. L. Pattison.
Stillbirth and neonatal death. (Annotation).
Identical twins. (Annotation).
Fœtal mortality: A clinical and pathological study. (Special article).

The health of professional women.

Fairfield's observations, although based mainly on a study of teachers, would probably apply, mutatis mutandis, to women in other professions. A comparison with domestically occupied women would be fallacious as involving the question of the effects of marriage. As the number of married women teachers in the London service is steadily decreasing, and as many of those still working are handicapped by special disadvantages, such as an invalid husband, Fairfield has omitted from this survey consideration of the effects of marriage on women's work. But there seems to be no reason to think that employment in the brain-working occupations outside the home has any detrimental effect on women's bodies or minds. They start with slight initial handicaps in the form of (*a*) a higher sickness rate than men in all forms of disease; (*b*) a liability to a special group of ailments of their own; (*c*) a tendency to age sooner and more suddenly than men. The conclusions, based on impressions rather than on exact figures (which do not exist), is that all these handicaps have been exaggerated and can be considerably reduced by improved hygiene. In the days of underpayment and restricted opportunities of work the hygiene of women was far inferior to that of men as regards clothes, exercise and diet. They have much leeway to make up, especially as regards exercise and diet, but every year brings a demonstrable improvement. Education in the hygiene of the special ailments of women has hardly begun, but is already making a substantial difference in reducing disability. Without undue optimism, it seems reasonable to consider that preventive medicine has yet much to contribute to the problem of maintaining the physical efficiency of the professional woman.

The examination of the gastric contents of infants, with some observations as to the value of lactic acid milk in infant feeding.

Cassie and Cox consider that the infant unless acutely ill appears capable of secreting sufficient HCl to attain a *p*H concentration corresponding to that of breast milk, or any milk mixture ordinarily used. This may be considered the normal *p*H required, and it appears doubtful whether

any benefit results from the use of milk mixtures with a higher *p*H. Apart from enteritis, in which they found lactic acid milk soured biologically to have a higher curative value, they obtained no benefit in cases of chronic vomiting.

Such milk appears to be a suitable food in infantile eczema, and probably in severe urticaria, but they consider that the use of soured milk in the average home is fraught with danger from pathogenic contamination.

Intra-uterine injection of pure glycerine.

As the result of an experimental inquiry into the bacteriological basis for the local treatment of puerperal sepsis and allied conditions by means of intra-uterine injection of pure glycerine, Compton concludes that its use is borne out by the behaviour of the tissue cells and bacteria to this reagent, the streptococcus being particularly susceptible. He believes that these new facts make glycerine one of the most interesting and ideal antiseptics and indicate for it a sphere of even greater usefulness in the treatment of inflammatory conditions.

An operation for creating an abdominal "shelf" in certain cases of visceroptosis in women.

Bonney describes the technique of his operation which, he states, results in the formation by the uterus and broad ligaments of a partition running transversely across the abdominal cavity separating it from the utero-vesical space. When standing, this partition forms a shelf on which the intestines rest, and the front portion of the abdominal cavity is shortened by three inches, diminishing the drag in the mesenteries and directing the intestinal pressure downwards and backwards into the pouch of Douglas.

Bonney has been performing this operation for some years with successful results and commends it as worthy of trial. Care should be taken to fix the uterus sufficiently high to give the bladder ample room, and silk should be used for the main fixation sutures.

A plea for drastic reforms in the teaching and practice of midwifery.

Theobaids is profoundly dissatisfied with the results of midwifery in England and Wales, and believes they are even worse than the figures suggest, and that the solution of the problem lies in a return to Nature and in better midwifery. He desires drastic changes in the teaching of midwifery and a change in the whole attitude towards midwifery. He suggests that nurses be forbidden to make vaginal examinations, to deliver breech presentations, and to control the fundus during the third stage; that the modified Garden of Eden method of delivery be adopted; that methods involving much vaginal manipulation be forbidden; that binders be abolished and free drainage during the puerperium be obtained; that several large combined gynæcological and maternity hospitals be instituted on the lines of the Rotunda Hospital; and that the student should spend much less time watching operations he will never perform, and a great deal more time watching normal labour while living in a maternity hospital.

A case of simultaneous abdominal and tubal pregnancy.

Sourasky records a case of combined abdominal and tubal pregnancy in which the woman lived fairly comfortably for nearly two and a half years with two dead fœtuses in the abdomen, one placenta being gangrenous and the corresponding fœtus just beginning to undergo decomposition.

The cancer problem.

The Lloyd Roberts Memorial Lecture : see abstract on page 119.

The treatment of contracted pelvis when first seen during labour.

Bourne points out that the large number of varieties of contracted pelvis and differences in actual size, together with the variations in the size and position of the child and strength of uterine contractions, call for corresponding elasticity of management and treatment, and emphasises that hospital experience shows that the best treatment for the minor degrees of contraction which hold up the head above or in the brim is *morphia, chloral* and *time*. Of far more value than ill-advised early application of forceps is the quiet sedative effect of the morphia-sleep which enables the head to mould and the patient to conserve her strength, while she is saved the laceration and damage which so seriously hinders her recovery.

Pregnancy, hyperpiesia and meningitis.

Lush records a case which shows hæmorrhagic meningitis associated with pregnancy and hyperpiesia in which recovery seems to have been determined by the spontaneous emptying of the uterus. The meningitic symptoms cleared up gradually but the fall in blood pressure and drop in the albumin content of the urine were markedly sudden and probably coincided with the death of the fœtus, which was expelled two days later.

The rationale and technique of combining operation with radium treatment in cancer.

Stevenson states that experience appears to show that when operation and radiation are combined in the treatment of cancer : 1. There is no advantage in giving a lethal cancer dose of radiation first and delaying operation more than a week, as further delay increases the difficulty of the operation and the shock. 2. Over-radiation of a cancerous mass which cannot be completely removed, followed immediately by its partial removal, lessens the shock and the operative difficulties. 3. At the operation it is an advantage to bury radium tubes and needles in the incised area and in the paths of dissemination. 4. It is an advantage to radiate the whole operation and suspicious area about three weeks after operation when the incisions have soundly healed. 5. The patient's general condition is the best guide to the extent of the operation and the intervals of time at which different areas are to be efficiently radiated.

F. E. T.

British Medical Journal.

October 2, 1926.

*The diagnosis in treatment of placenta prævia. J. Barris.
Cancer mortality and age rates. S. Davis and J. Brown (Correspondence).

October 9, 1926.

An unusual obturator hernia. A. J. Blaxland.
Cancer mortality and age rates. E. Hudson (Correspondence).

October 16, 1926.

A case of gas gangrene in labour. H. E. Thorn.
Poor-law midwifery fees. R. C. Worsley. (Correspondence).

October 23, 1926.

*Discussion on causes and treatment of uterine hæmorrhage without gross physical signs.
I. Opening papers. B. Whitehouse and W. F. Shaw.
II. Discussion. W. W. King, R. H. B. Adamson, J. S. English, L. C. Rivett, A. J. Eames, M. Jones, T. H. Richmond, Comrie-Sharp and C. Berkeley.
Acute intestinal obstruction due to hydrocephalic child. H. J. D. Smythe.
British Empire cancer campaign. B. Moynihan. (Correspondence).
Obstetrical theory and practice. M. C. De Garis. (Correspondence).

October 30, 1926.

Contagious bovine abortion and undulant fever. J. C. Remildy (Correspondence).

November 6, 1926.

*Pulmonary embolism following childbirth. T. Mc Culloch and W. J. Young.
*Strangulated hernia in an infant. J. O'C. Fitzsimons.

November 13, 1926.

*The cancer problem. W. E. Gye.
The virus theory of cancer. (Leading article).
The development of vaginal operations for genital prolapse. F. A. Nyulasy.
Lead as an abortefacient. R. Craig.

November 20, 1926.

*The nature of malignant neoplasia and treatment of the disease with lead.
I. The Liverpool Cancer Research Organization. W. Blair Bell.
II. Some physico-chemical and biochemical aspects of malignant neoplasms. W. C. M. Lewis.
III. Some pharmacological effects of lead. W. J. Dilling.
IV. The action of colloidal lead on animal tumours. F. C. Wood.
V. Histological changes found in cancerous tissues treated with colloidal lead suspension. E. E. Glynn.
VI. The clinical effects of lead in the treatment of malignant disease. L. Cunningham.
VII. Some of the views and work of the Liverpool Cancer Organization. W. Blair Bell.
VIII. Discussion. S. Miller and F. Coke.

November 27, 1926.

*Pulmonary embolism following childbirth. F. D. Spencer and J. A. Dawson.

The cancer virus. F. B. Skerrett.

December 4, 1926.

Cancer research. W. J. Simpson. (Correspondence).

December 11, 1926.

Treatment of cancer by lead. (The Week).

Radium and uterine cancer (The Week).

Lead treatment of cancer. R. G. Canti.

Treatment of cancer by oöphorectomy. G. T. Beatson. (Correspondence).

December 25, 1926.

*Fœtal tumour obstructing labour. L. W. Dugland.

Vaginal operations for genital prolapse. R. H. Paramore (Correspondence).

Post-operative radium in cancer of the breast. F. Hernaman-Johnson. (Correspondence).

The diagnosis in treatment of placenta prævia.

Barris points out that the diagnosis and treatment of placenta prævia is not only a subject of the greatest practical importance, but one much debated and upon which opinion is still divided.

He summarizes his views as follows :—

1. Early diagnosis is essential.
2. Once the diagnosis is made the pregnancy must be terminated.
3. "Slight cases" are best treated by rupture of the membranes and a tight abdominal binder.
4. Plugging is inadvisable, except as a very temporary measure.
5. Certain selected cases may be treated by Cæsarean section.
6. Most cases are best treated by external version and plugging by the half-breech. The labour in this case must be conducted slowly.
7. Institutional treatment is necessary in all but the "slight cases."

Discussion on causes and treatment of uterine hæmorrhage without gross physical signs.

Whitehouse thus summarizes his conclusions :—

1. Menstruation is the monthly abortion of the decidua of an unfertilized ovum.
2. The menstrual discharge is the lochia of an unfertile abortion.
3. The pre-menstrual endometrium is the menstrual decidua, and its development and life are dependent upon the corpus luteum.
4. Menstrual abortion is initiated by death of the unfertilized ovum and retrogression of the corpus luteum.
5. Pathological uterine hæmorrhage falls into one of four clinical groups : (*a*) epimenorrhœa, (*b*) menostaxis, (*c*) menorrhagia, (*d*) metrostaxis.
6. Epimenorrhœa is the clinical manifestation of *hyper-activity* of the sex complex.
7. Menostaxis is an *incomplete* unfertile menstrual abortion.
8. Menorrhagia is the result of uterine *insufficiency*, which may be (*a*)

developmental, (b) inflammatory, or (c) degenerative. The insufficiency may be associated with lesions in (1) the metrium, or (2) the endometrium.

9. Metrostaxis is commonly the *reflection of outside influences* upon the uterus. The accessory factors most commonly associated with irregular uterine bleeding are (1) functional hyperthyroidism, and (2) hypersensibility of the sympathetic nervous system.

10. Estimation of the blood tolerance of sugar and of the basal metabolic rate provides important data in the investigation of uterine hæmorrhage at periods of unstable equilibrium, especially puberty and the menopause.

Shaw points out that until recent years the cause of uterine hæmorrhage had been sought in some pathological change of the uterine wall or endometrium, but to-day, in making such an investigation, we have to bear in mind disorders of the endocrine glands, and disordered physiological action of the uterus and endometrium, as well as pathological changes in these tissues. Changes in the endometrium present the greatest difficulty, and many conditions which were formerly considered to be due to pathological changes are merely part of the physiological monthly cycle, while others may be the manifestation of disordered physiological processes outside the endometrium. The endometrium is one of the most interesting tissues in the body, and there are still many changes found in it which require explanation. He discusses chronic metritis, subinvolution and hypertrophy as causes of hæmorrhages.

Pulmonary embolism following childbirth.

In McCulloch's case the patient was a multipara aged 35, who had had a normal labour in which the placenta was expressed by Crédé's method. Five days later thrombosis developed in the veins of the left thigh. The patient was kept in bed one month. Two weeks later severe pain suddenly occurred in the chest with irregular gasping respiration and slight hæmoptysis, the condition becoming critical. On the following day symptoms of thrombosis in the right leg appeared. The patient recovered.

In Young's case a strong healthy girl aged 18 years had a normal labour without intervention, baby and placenta being born before the doctor's arrival. She got up on the tenth day feeling perfectly well. On the next day she got up from her chair, picked up the baby, suddenly let it fall, fell herself to the floor, and died almost immediately. A necropsy was not performed.

Spencer's case was a strong healthy primapara who was normally delivered of a full-time girl. On the tenth day she had a small pulmonary embolism which was not fatal.

Dawson's case was a healthy woman aged 22 years, who had a normal labour. On the tenth day slight pain in the right thigh was complained of, but no sign of interference of the blood supply could be found on examination. She was kept in bed until the fifteenth day. On the sixteenth day when apparently well in every respect, she was again allowed up. While dressing she fell to the floor and was dead within two hours.

Strangulated hernia in an infant.

A full-time male child was born with a right inguinal hernia which became strangulated on the nineteenth day. Failing to reduce it by taxis, Fitzsimons performed a radical cure. The child was kept on the breast and made an uneventful recovery.

The cancer problem.

In this Lloyd Roberts Memorial lecture, Gye traces the development over many years of experimental research that has cleared the ground for modern investigations, and restates the original experiments on which his conclusions are based. He believes that cancer is a specific disease caused by the combined operation of two factors, namely, an ultra-microscopic organism or virus and a "specific factor"—an accessory chemical substance which determines the special characters of the resulting cancer.

The nature of malignant neoplasia and treatment of the disease with lead.

This is a symposium on the work of the Liverpool Cancer Research Organization under the directorship of Blair Bell, which is based on the latter's view that the chorionic epithelium—the trophoblast—and especially the outer layer of syncytium, is normally malignant in character, in that it has the powers of eroding the blood vessels and other maternal tissues in the search for nutriment, of cellular multiplication and of forming metastases, evidence has been sought to support or negative the view that the cancer cell is a reversion on the part of the somatic cell to the chorionic epithelium—that is to say, dedifferentiation occurs because the process is reversionary.

Blair Bell adds that there is still a considerable danger that if lead be used indiscriminately in the treatment of malignant disease many fatalities will follow, and the method itself, either from excessive caution or too much zeal, will be brought into disrepute.

Fœtal tumour obstructing labour.

Labour was obstructed in a primigravida aged 27, by an enormous tumour in the abdomen of the infant, making delivery impossible. After embryotomy the tumour proved to be a large horse-shoe shaped polycystic kidney with two distended ureters attached. It was twice as big as the fœtus and occupied the whole abdomen. No other kidney was found and both suprarenals were present. The cysts were numerous and varied in size.

F. E. T.

The Journal of Physiology

Vol. LXI, No. 4, *August* 6, 1926.

*Studies on the internal secretion of the ovary. I. The distribution in the ovary of the œstrus-producing hormone. A. S. Parkes and C. W. Bellerby.

*The relation between the corpus luteum and the mammary gland. G. Drummond Robinson and S. A. Asdell.

Vol. LXII, No. 2, *December* 10, 1926.

*Studies on the internal secretion of the ovary. II. The effect of injection of the œstrus-producing hormone during pregnancy. A. S. Parkes and C. W. Bellerby.

Studies on the internal secretion of the ovary. I. The distribution in the ovary of the œstrus-producing hormone. II. The effect of injection of the œstrus-producing hormone in pregnancy.

1. Using cows' ovaries, Parkes and Bellerby obtained from 200 to 300 mouse-units of oestrus-producing extract per kilogram of tissue.

The residual tissue had a greater activity than the corresponding liquor folliculi in five out of eight cases, while in the remaining three cases the liquor folliculi had the greater weight for weight activity. Hence there appears to be some correlation between the size of the follicles and the relative activity of liquor folliculi and residual tissue.

II. The injection of oestrin during the early stages of pregnancy causes the rapid reappearance of œstrus and the termination of pregnancy. During the later stages of pregnancy injection in sufficient amount will nearly always terminate the pregnancy, but the amount required is much greater (about twice as much).

In cases where litters are born after injection of the mother during the the later stages of pregnancy, no abnormality in sex differentation occurs in the males and no oestrus symptoms are observed in the females.

The relation between the corpus luteum and the mammary gland.

Drummond-Robinson and Asdell found that removal of the corpora lutea in the pregnant goat was followed by abortion. If the removal was performed before the globulin stage of mammary secretion was reached, milk was not secreted in bulk. Removal after the globulin stage was followed by an immediate copious secretion of milk. The stimulus for growth having been given to the mammary cells by the corpus luteum, they appear to be able to reach the globulin stage without receiving a continued stimulus. If by excising the corpora lutea, the stimulus is removed, the attainment of the globulin stage is not followed by milk secretion. The influence of the corpus luteum upon the mammary gland is a variable one, and the theory that an inhibiting hormone prevents or causes a decline in milk secretion until parturition occurs, appears to be unnecessary.

F. E. T.

British Journal of Experimental Biology.

Vol. III, No. 3, *April*, 1926.

The energy sources in ontogenesis. I. The urea content of the developing avian egg. J. Needham.

*The effect of gonadectomy on the weight of the kidney, thymus and spleen of mice. K. Masui and Y. Tamura.

Vol. III, No. 4, *July*, 1926.

*The effect of fat soluble vitamin A deficiency on reproduction in the rat. A. S. Parkes and J. C. Drummond.

Vol. IV, No. 1, *September*, 1926.

*Structural changes in the suprarenal gland of the mouse during pregnancy. Y. Tamura.

Studies on the sex-ratio and related phenomena. (*a*) Observations on fertility and sex-ratio in mice. A. S. Parkes.

Vol. IV, No. 2, *December*, 1926.

The energy sources in ontogenesis. II. The uric acid content and general protein metabolism of the developing avian egg. III. The ammonia content of the developing avian egg and the theory of recapitulation. J. Needham.

*The vitality of the spermatozoa in the male and female reproductive tracts. J. Hammond and S. A. Asdell.

The effect of gonadectomy on the weight of the kidney, thymus and spleen of mice.

Masui and Tamura's results do not agree with Lipschutz's hypothesis of an "asexual type" for as the result of gonadectomy in the male the weight of the kidney thymus and spleen approaches that of these organs in the female or, in other words, gonadectomy is followed by a development of the characters typical of the opposite sex.

The effect of fat soluble vitamin A deficiency on reproduction in the rat.

Vitamin A deficiency in young animals checks growth which is resumed when the complete diet is restored. Such animals are sterile though there is no anatomical abnormality to account for the sterility, gametogenesis being found in progress. The sterility is, therefore, due to physiological debility and disinclination to copulate.

Vaginal smearing showed that the cyclic activity in the female genital organs, associated with oestrus cycle occurred in the deficient females. When normal weight is attained after recovery on normal diets, breeding takes place freely, and fertility and sex-ratio show no marked abnormality.

Structural changes in the suprarenal gland of the mouse during pregnancy.

According to Tamura, current opinion concerning the relationship of the suprarenal and ovary can be stated as follows :—

1. The zona reticularis is hyperfunctioning at the period of "heat."
2. During pregnancy when the ovary and adrenals are in the disfunctioning stage, the zona reticularis degenerates and disappears.
3. The zona reticularis reappears when the ovary regains its normal functioning.
4. In the blood of the gonadectomised female there is present an emyzme which stimulates the development of the ovary.
5. Complete gonadectomy in the female has no effect on the structure of the suprarenal.

The vitality of the spermatozoa in the male and female reproductive tracts

Hammond and Asdell found that in the rabbit the sperms may retain their fertility in the male tract up to 38 days, but in the female tract only up to 30 hours. In cases where the sperms had remained in the female tract for six to 30 hours before ovulation, small litters were frequently produced; it is suggested that this is due to the end point of the vitality of the sperms falling within the limits of time during which ovulation occurs.

F. E. T.

Archives of Diseases in Childhood.

Vol. I. No. 1, *February*, 1926.

A note on the clinical diagnosis of rickets in infancy. H. Mackey.

Notes on measures in infant feeding. G. A. Harrison and H. Thursfield.

Vol. I, No. 2, *April*, 1926.

*An investigation of sclerema neonatorum; with special reference to the chemistry of the subcutaneous tissues (part 1). A Harrison. With a histological report by J. W. McNee.

Vol. I, No. 3, *June*, 1926.

*An investigation of sclerema neonatorum; with special reference to the chemistry of the subcutaneous tissues (Part II). G. A. Harrison.

Vol. I, No. 4, *August*, 1926.

Congenital absence of tibia. E. L. Evans and N. R. Smith.

*A study of gastric acidity in infants. L. Wills and D. Paterson.

*Calcium absorption in relation to gastric acidity. (A study in rickets). L. Wills, P. Sanderson and D. Peterson.

Vol. No. 5, *October*, 1926.

*A contribution to the study of the causation of fœtal death. C. D. Tingle.

Congenital atresia of the alimentary tract. W. P. H. Sheldon.

Congenital duodenal stenosis due to peritoneal bands. T. T. Higgins and D. Paterson.

The day-and-night creatinine and creatine in the urine of infants. O. S. Rougichitch.

Tuberculous dactylitis in infancy. G. Herzfeld and M. C. Tod.

Vol. I, No. 6, *December*, 1926.

The creatinine co-efficient in the infant. O. S. Rougichitch.

An investigation of sclerema neonatorum; with special reference to the chemistry of the subcutaneous tissues.

Harrison investigated sclerema neonatorum adiposum with special reference to the chemistry of the subcutaneous tissues in five cases giving the post-mortem and histological findings in the four which were fatal. In two cases there were cysts in the subcutaneous fat. Histologically this tissue showed evidence of chronic inflammation and repair with giant-cell formation, and contained abundant anisotrophic crystals of neutral fats (glycerides). X-rays revealed opaque deposits indicating calcification with excess of calcium and phosphorus in the subcutaneous tissues. The melting-point of the subcutaneous fat was slightly raised, the cholesterol was increased in amount and the iodine and saponification values were normal. Harrison concludes that the sclerema is a primary inflammation of the subcutaneous tissues of unknown cause.

Calcium absorption in relation to gastric acidity.

The authors conclude that gastric acidity does not appear to be a limiting factor in the supply of calcium to the body.

A study of gastric acidity in infants.

Wills and Paterson found that the gastric findings in infants, as in adults, were more closely associated with the general condition of the child than with any particular feed or disease.

A contribtion to the study of the causation of fœtal death

From an investigation of the causation of fœtal and neo-natal death in a series of 160 cases, Tingle found that :—

1. More fœtuses die as the result of excessive trauma during delivery than from maternal or fœtal disease.
2. The fatal results of excessive trauma are due to hæmorrhage.
3. Certain maternal morbid states predispose to fœtal injury during delivery.
4. Factors predisposing to hæmorrhage are prematurity, excessive venous congestion and the hæmorrhagic liathesis.
5. Pneumonia is the commonest infection causing neo-natal death.
6. The term 'congenital heart disease" is frequently a misnomer.

F. E. T.

South African Medical Record.

October 9, 1926.

*Calcium metabolism, and the effects upon the calcium blood-level of the parathyroid and ovarian hormones. L. Mirvish.

Calcium metabolism, and the effect upon the calcium blood-level of the parathyroid and ovarian hormones.

Mirvish discusses the physiological action of calcium, the regulation of calcium blood-level through the agency of the endocrine secretions—especially those of the parathyroids and the gonads, the calcium blood picture in disease—especially in tetany, nephritis, eclampsia, rickets, gout, arthritis, exophthalmic goitre and otosclerosis and the therapeutics of and indications for parathyroid medication. With regard to the relation of the ovaries to calcium metabolism, the effect on skeletal growth of castration in young animals is brought forward to show that the removal of ovarian activity causes calcium retention. Blair Bell is quoted as drawing attention to the significance of the large percentage of calcium in menstrual blood, and its dependence on the calcium excreting function of the ovary, menstruation being absent during pregnancy and lactation when the calcium is diverted to other channels, *i.e.*, the fœtus and the milk respectively. The observation that the later the onset of menstruation the greater is the skeletal growth also co-relates the beginning of ovarian function at puberty with a katabolic metabolism of calcium so that it is no more available for the skeleton and is lost through menstruation or is utilized by the fœtus.

The influence of the castration-therapy of osteomalacia also indicates the relation of the ovary to calcium metabolism. In this disease hyperplasia of the parathyroids has been noted, and has been interpreted to represent an attempt on the part of the organism to counteract the excessive ovarian activity. Since the introduction of accurate blood-calcium estimations the relation of ovary and calcium has been sought in a more direct manner. Thus in pigeons an increase in blood calcium at the ovulation period has been found. A raised value of serum calcium has also been found in ovarian insufficiency. In women contradictory results have been obtained, but it is agreed that at the menopause there is for a time a disturbance of the normal fine balance that exists between the

various endocrine glands, and the blood calcium is much more liable to fluctuation than under normal conditions. The mechanism by which the ovarian hormone affects the blood-calcium is uknown, but Mirvish considers that it antagonises the parathyroid. He records several cases of functional menorrhagia in which normal menstruation was recovered by the oral administration of parathyroid, and claims that clinically, certain cases of uterine hæmorrhage in which no organic lesion is found, probably constituting a definite clinical unity, can be cured very rapidly by the oral administration of parathyroid.

F. E. T.

American Journal of Obstetrics and Gynæcology.

July 1926.

*A contribution to the biomechanism and the pathology of ectopic pregnancy with a consideration of some of its clinical phenomena. M. R. Robinson.

*The differentiation of the cancer tissue. J. E. Davis.

*The clinical and pathologic features of puberty hæmorrhage. S. A. Wolfe.

*The normal and pathologic physiology of pregnancy. H. Ehrenfest.

Sterility associated with habitual amenorrhœa relieved by X-ray therapy. I. C. Rubin.

*The conservative treatment of uncomplicated retrodisplacement of the uterus. P.Brooke Bland.

Air insufflation of the tubes. P. Graffagnino.

Sarcoma of the stomach. G. F. Chandler.

*The intravenous magnesium sulphate treatment of eclampsia. E. M. Lazard, J. C. Irwin and J. Vruwink.

Breast cancer metastasis. W. A. Coventry.

Proceeding of the third annual conference of state directors of maternity and infancy work held at Washington.

Selected abstracts—Diseases complicating pregnancy.

August 1926.

*Experimental studies on the toxemias of pregnancy. Can histamine poisoning be regarded as the etiologic factor? J. Hofbauer.

*The use of iodised oil (Iodipin) as a diagnostic aid in gynæcology. Q. U. Newell.

Report of a case of general edema of the fetus from a renal eclamptic mother. B. L. Lieberman.

*Report of a case of choriocarcinoma of the uterus complicating pregnancy. J. J. Gill.

*A study of the basal metabolism, weight and blood chemistry following bilateral oöphorectomy. S. H. Geist, M. A. Goldberger, J. Teiss and H. Lande.

Problems of organ conservation in pelvic surgery. W. P. Graves.

*A contribution of the biomechanism and the pathology of ectopic pregnancy, with a consideration of some of its clinical phenomena (Continued from July issue). M. R. Robinson.

The treatment of eclampsia with blood serum from eclamptics. (Preliminary Report). J. J. McMahon.

Varicocele of the broad ligament. W. H. Fisher.
The preoperative responsibilities of the gynæcologist. W. T. Dannreuther.
A suggestion for drainage in Cæsarean section. S. S. Rosenfield.
A clinical study of one hundred and thirty-three pregnancies following Cæsarean section. K. M. Wilson.
The Committee of Maternal Welfare report of maternal health.
The physician's part in a practical state programme of prenatal care. F. L. Adair.
Collective review—new books. R. T. Frank.

A contribution to the biomechanism and the pathology of ectopic pregnancy with a consideration of some of its clinical phenomena.

Robinson herein supplies some detailed case histories of ectopic pregnancies which he proposes to consider in Part II of the article (vide abstracts for August)

The differentiation of the cancer tissue.

Cancer cells or cancer tissue cannot be differentiated either *in vivo* or *in vitro* from dead cells or from normal cells.

Two genetic sources undoubtedly supply the units of cancer formation, namely, injured and embryonic cells.

It is plausible to believe that heredity may supply in certain families and individuals protoplasm of low potential quality for ultimate differentiation, and the physical evidence will appear in the abnormal number of cells unable to gain maturity. The preponderance of evidence and modern opinion point to irritation, regardless of its type (whether traumatic, thermic, chemical, bacteremic or parasitic) as the exciting cause, which can act with equal facility upon embryoid or atavistic type of cells in producing uncontrolled, incompletely organized, disfunctioning tissue.

Under the conditions prevailing in cancer, function no longer determines form, but conversely, form determines function, which is inadequate, abnormal and superfluous.

With inadequate tissue organization, lacking as it does nerve and lymph supply, and possessing a precarious blood vessel canalization, supported by an uncertain stroma and excising free parasitic characteristics, there can be little wonder that degenerative changes are constant.

The chemical activities of cancer tissues tend towards acidification of body fluids with consequent body demineralization and cancer tissue hypermineralization.

The differentiation of cancer cells can be advantageously studied by estimating both the number of the new growth cells differentiated and their nearness or remoteness to normal standards of form.

Observation of the cell division figures and the degenerative changes in nuclei affords useful information as to rapidity of growth.

It should be expected that cancer cells will differentiate after the pattern of their parent tissue, but frequently the influence of a new environment compels a close resemblance to surrounding structures, but occasionally no imitation of either is recognizable. The kind of food consumed or the mode of life pursued have little to do with the development of cancer.

The better nutrition supplied by younger subjects is the greatest factor in producing a maximal growth-impulse in malignancy. Growth, pressure, nutrition, specialized function and organization all represent central, general purposeful provisions for the body, but malignant growth has no purpose in the body economy. The cancer tissue may repeat or depart from its pattern form. It may or may not be influenced by its environmental structures. Tissue susceptibility to cancer varies widely and metastasis from different anatomic locations is often distinctive.

The connective tissue is the only functional relation of the normal to the tumour tissues, and reaction to the cancer can be judged by the stroma formation as well as by degeneration. As epithelial cells depart less from their primordial type, they consequently have a greater potential and actual growth impulse. Differentiation, which is a change from the general to the special in type of cell, tissue, organ, and animal, is always incomplete in all four types if it is cancer tissue.

The clinical and pathologic features of puberty hæmorrhage.

From a clinical and pathologic study of twenty-six cases of hæmorrhage of puberty, Wolfe has formed the opinion that, though the uterus is the direct seat of the bleeding, the real cause lies in excessive and prolonged stimulation of the endometrium by the tension of the fluid in cystic Graafian follicles. No corpora lutea are formed hence the uterus loses the inhibitory action of this body.

A soft patulous cervix is "pathognomonic" and the uterus may not be enlarged. Symptoms recur after curettage, but are controlled by small doses of radium. No explanation is offered as to why the action of radium upon the endometrium should control bleeding essentially caused ex hypothesi by ovarian disease.

The normal and pathologic physiology of pregnancy.

Ehrenfest gives a very full review of the modern literature bearing upon this subject, which is manifestly unsuitable for abstraction. There is a long and useful bibliography containing 115 references.

The conservative treatment of uncomplicated retrodisplacement of the uterus.

This most refreshing paper by Bland is an amusing, but at the same time absolutely uncompromising, attack upon those who operate upon uncomplicated retroversion by any of the "one hundred methods" which have been described. The teaching that nervousness (functional and even organic), sterility, leucorrhœa, disturbed menstruation, dyspareunia, irritation of the bladder and bowel, "and of course, the nemesis of all women, *backache*", is characterized as "utterly false and the party to benefit thereby is obviously not the patient but the individual who unscrupulously lends himself to such an iniquitous system of medical banditry!" In considering treatment Bland will admit no compromise because, except in very rare instances, he believes that a simple displacement of the uterus is "not worth treating."

The intravenous magnesium sulphate treatment of eclampsia.

Lazard, Irwin and Vruwink treat eclampsia by the intra-venous injection of 20.0 cc. of a 10 per cent solution of magnesium sulphate if

the blood pressure is over 150. The injection can be repeated. There are sometimes mild "reactions" after the injections. The maternal mortality is 9.0 per cent.

Experimental studies on the toxæmias of pregnancy.

Following acute histamine poisoning in pregnant guinea pigs, a number of phenomena have been observed by Hofbauer which are highly suggestive of premature separation of the normally implanted placenta as it occurs in women :— the separation itself, engorgement of the vessels of the uterus and broad ligament, uterine spasm, hæmorrhage into various organs, marked shock, and histologically, œdema of the uterine wall and degenerative changes in the liver and kidneys.

In carnivora, under similar conditions, histologic changes are produced which are suggestive of those found in women who died of eclampsia, peripheral necrosis of the liver (both of the anæmic and hæmorrhagic type) associated with the formation of thrombi and bile stasis, and, in the kidney, degenerative changes in the epithelium of the convoluted tubules. On the other hand, the administration of histamine to carnivora over a prolonged period results in changes in the liver and kidneys suggestive of those encountered in pernicious vomiting. Moreover, evidence has been adduced to show that the production of such changes can be prevented by the simultaneous administration of insulin.

The relation of histamine intoxication to the electrolytes in the blood, to the activity of the adrenals and the pituitary and to the vasomotor centre in the midbrain are discussed, and a possible explanation for the occurrence of hypertension is offered.

The striking similarity regarding blood chemistry in eclampsia and acute histamine intoxication is emphasized, and local anæsthesia is suggested as the procedure of choice in operations for premature separation of the placenta and for eclampsia. Transfusion forms an integral part of treatment in severe cases of premature separation of the normally implanted placenta. The liberal administration of oxygen—combined with an appropriate supply of glucose is advocated in severe cases of eclampsia. The possible sources of histamine during pregnancy and its biologic significance are discussed.

Finally, it should be borne in mind that pure histamine and the various substances in the histamine group—a number of protein derivatives of unknown structure—have a similar biologic effect upon the vascular system.

The use of iodised oil (Iodipin) as a diagnostic aid in gynæcology.

Summarizing his personal experience to date, Newell states that iodipin will prove of diagnostic value :—

1. In sterility cases where the Fallopian tubes are found obstructed, to determine the character and location of the obstruction. It offers the welcome opportunity to decide definitely whether or not the case is suitable for operation.
2. When several masses are palpable with the pelvis. Injection and X-ray study will differentiate the uterus from the other masses.
3. In cases in which the pelvis is blocked by one large mass. By this method the precise diagnosis can be made whether the tumour is originating from ovary or uterus.

4. In cases in which a foreign body is suspected within or outside the uterine cavity.
5. Iodipin injections into the uterus prove helpful in differentiating chronic appendicitis from a right-sided salpingitis, which means that they possibly might enable us to make a definite diagnosis of a tuberculous Fallopian tube.
6. It is a valuable aid in indicating the size of the uterus, and in determining whether the cavity is encroached upon by any masses such as a fibromyoma, a carcinoma of the fundus, etc.
7. Iodipin injections carefully and skilfully done, are not likely to cause any harm.

Report of a case of choriocarcinoma of the uterus complicating pregnancy.

A woman (aged 21, 2-para) was admitted to hospital on account of a hæmorrhagic discharge and loss of strength. A chronic appendix was removed. The finding of a uterus large and studded with "tubercles" was sufficient evidence to warrant Gill in performing hysterectomy. The uterus contained a five-months fœtus with an infiltrating chorio-carcinoma invading the muscle. The patient was alive and well a year later.

A study of the basal metabolism, weight and blood chemistry following bilateral oophorectomy.

This is a technical paper but the results of the investigation may be summed up by saying that it seems that castration in women with previously functioning ovaries does not result in a consistent variation of the basal metabolism or the body weight. There seems to be no definite relationship between the variations in weight and basal metabolism. Likewise the blood chemistry and pressure remain uninfluenced.

These results may be due to (a) the inaccuracy of our present clinical methods of examination (b) the influence of other important extraneous factors (c) the absence of any ovarian influence.

The changes above mentioned are not of sufficient fundamental importance to warrant their being used as an argument for the conservation of the ovaries.

A contribution of the biomechanism and the pathology of ectopic pregnancy, with a consideration of some of its clinical phenomena

Robinson, after giving the clinical histories in the July issue, propounds in this part, four questions :—

1. How closely does the biomechanism of gestation simulate intra-uterine pregnancy?
2. Is ectopic gestation the result of mechanical obstruction, and, if not, to what may it be ascribed?
3. Is "tubal abortion" a correct term?
4. What is the pathology of uterine bleeding in ectopic gestation?

His answers are :—

1. The ectopic simulates uterine gestation in the mode of nidation and the formation of the decidua, but a true reflexa is absent in certain cases of intra-mural implantation. The "decidual reaction" is not of inflammatory origin. The pathological results of ectopic gestation are the result of the insufficiency of the nidation bed.

2. From a survey of the possible causes of extrauterine pregnancy, Robinson classified them in the following order of importance:— (a) Functional disturbances of the tubal peristalsis; (b) Precocious nidation of the ovum; (c) mechanical causes *within* or *without* the tube.
3. Robinson does not approve of the term "tubal abortion" because the villi are so implanted as to prevent abortion except by their actual rupture; and also he asserts that the tube wall at the site of the pregnancy has lost its power of contraction.
4. The bleeding from the uterus is the result of the removal of the inhibiting function of the corpus luteum, consequent upon the death of the ovum.

The author's mortality was 0.7 per cent., and, though he thinks that he might have saved the only woman he lost, if he had drained the pelvis, he is opposed to the routine use of drainage.

He operates as soon as he has made a diagnosis for "to wait for the shock to subside is meddlesome therapy." He removes the tube but tries to save the corresponding ovary. He did not sterilize the patient by removing the healthy tube.

Amongst the less common symptoms of ruptured ectopic gestation, Robinson refers to a temporary anuria due to exsanguination, shoulder pain and bluing of the umbilicus.

W. W. King.

Surgery, Gynecology and Obstetrics.

Vol. xliii, No. 2, *August* 1926.

Technique of abdominal hysterectomy for carcinoma of the uterus. K. Franz.

*The early diagnosis of anencephalus. J. T. Case and T. E. Cooper.

The byrth of Mankynde. A. Brown. (Old masterpieces in Surgery).

Vol. xviii, No. 3, *September* 1926.

*Hæmagioma of the uterus; report of a case. F. W. Wright

The anatomical basis for the study of splanchnoptosis. A. C. Vietor.

*Pregnancy parturition and health after surgical replacement of the uterus—a retrospect. C. Reyes.

*Malignant melanoma of the vulva; with reports of three cases. J. L. Goforth.

*Postoperative hæmolytic streptococcus wound infections and their relation to hæmolytic streptococcus carriers among the operating personnel. F. L. Meleney and F. A. Stevens.

Method of repair of postoperative ventral hernia. O. F. Lawson.

*The use of ethylene in obstetrics; a report of eighty-five cases. J. Kreiselman and H. F. Kane.

The technique of abdominal hysterectomy for carcinoma of the uterus; a correction. (Correspondence).

Importance of abdominal rigidity. A. F. Jones.

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*The relation in prognosis to the histological findings in carcinoma of the cervix. A. Plant.

*Results with the Watkin's interposition operation in the treatment of prolapsus uteri. L. Brady.

*Pregnancy after salpingectomy. M. Douglass.

*Hernia of the ovary. W. J. Moore.

Technique of the Mayo operation for cystocele. J. C. Masson.

*Amputation of the cervix with application of the Sturmdorf flap principle. R. W. Te Linde.

A satisfactory method of closing the "difficult" peritoneum. A. J. Ward.

A critical review of five hundred consecutive deliveries. C. H. Davis.

The early diagnosis of anencephalus.

Four cases are reported in which the diagnosis of anencephaly was made before the beginning of labour. In each case the diagnosis was based upon atypical physical findings plus the proof furnished by the roentgenogram, and verified by operation. These four instances represent all the cases of anencephalus which entered the clinic prior to the onset of labour (since 1915). Two other patients who were not seen until labour was well advanced were found with anencephaly, but the diagnosis was already evident from the appearance of the presenting deformed head when the patients were first seen.

A brief review of the literature shows that without the roentgen examination it is possible to do more than conjecture the presence of anencephaly. It is therefore, reasonable to urge a routine roentgen study of all obstetrical cases presenting hydramnios, when there is difficulty in identification of the fetal poles, or when the fetal heart sounds are weak or uncertain. With the aid of the X-ray it is possible to state definitely whether or not an anencephaly exists.

There is a brief review of the cases of anencephaly thus far reported in the literature, successfully recognized before the onset of labour. Anencephaly represents only a relatively small proportion of fetal monstrosities, and the monstrosities represent only a small part of the field of usefulness of the roentgen-ray in obstetrical practice.

Hæmangiomata of the uterus.

In the case described and figured by Wright there were no symptoms referable to the hæmangioma, but in two cases recorded in the literature there was alarming hæmorrhage. Cavernous hæmangiomata of the uterus are rare, but in certain cases give rise to symptoms which require prompt surgical intervention.

Pregnancy, parturition and health after surgical replacement of the uterus.

In this retrospect based upon a systematic follow up, 2377 selected gynæcological patients operated on in the Philippine General Hospital between the years 1909 to 1922 inclusive it was found that surgical replacement of the uterus and minor associated procedures do not appear to affect pregnancy parturition and health unfavourably. This is shown by the larger number of patients who have borne children (48 against 25 per cent.), delivered normally (89 against 10 per cent.), and reported to be doing excellently or enjoying better health after operation (61 against 39 per cent.) than those who reported otherwise.

A large number of patients is reported to be doing excellently or enjoying better health among those who continued or commenced bearing than those who ceased bearing children after operation (71 against 54 per cent.).

Venereal history, salpingitis and adhesions were found to be proportionately much more frequent among patients who ceased bearing children than among those who continued or commenced bearing them after operation (59 against 20 per cent.)

Malignant melanoma of the vulva.

Goforth reported three cases of malignant melanoma of the vulva, all primary on the labium majus. His studies, like those of others, indicate that the melanomata are of epithelial origin. Vulval pigmented nævi should be regarded as being potentially malignant, and should be treated by excision, with a wide margin of apparently healthy tissue in all directions. Vulval nævi showing unusual behaviour should be thoroughly removed together with the regional lymphatic area.

The proper treatment for those cases in which malignant change is well established, or in which recurrence exists, consists in a radical application of the above,

A rigid and frequent "follow-up" of the patient is necessary if the patient is to be given the advantages of the earliest treatment of a local recurrence, or if a "cure" is to be proved.

Post-operative hæmolytic streptococcus wound infections and their relation to hæmolytic streptococcus carriers among the operating personnel.

Meleney and Stevens consider that post-operative wound infections in clean cases may be produced by organisms expelled from the nose or mouth of operators, nurses or visitors, and that all persons who may in any way come in proximity to the sterile field during an operation should mask very carefully both the nose and the mouth.

The use of ethylene in obstetrics.

In this review of 85 cases Krieselman and Kane found that :—

1. Complete analgesia was obtained in 84 per cent. of the cases, appreciable relief from pain in 13 per cent. and failure in 3 per cent.
2. Progress during the second stage of labour seemed to be more rapid.
3. No harmful effects on the child were noted.
4. Podalic version was easily performed under ethylene anæsthesia.
5. Ethylene seemed to be the ideal anæsthetic for Cæsarean section.
6. The efficacy of ethylene seemed to be increased by the use of morphine in the first stage.
7. Ethylene is valuable in the second stage of labour because with it analgesia and anæsthesia are rapidly induced; its action is fleeting; there are apparently no latent ill effects on the mother or child.

The relation in prognosis to the histological findings in carcimona of the cervix.

In studying the material from patients admitted to the New York Womens' Hospital, Plant adopted the classification of Martzloff who established four types of cervical carcinoma, one of which, adeno-

carcinoma, is chiefly characterized by its form of growth, while in the three others, the type of the tumour cell is the means of differentiation. This difference in the origin of the group and other difficulties connected with adenocarcinoma of cervix, induced Plant to consider adenocarcinoma separately from the other groups.

The cells which are characteristic of the three groups of epidermoid carcinoma of cervix are the "spinal cell," the "transitional cell," and the "fat spindle cell." Martzloff prefers only to make a statement on the morphological appearance of the different cell types, not on the histogenesis. The term "spindle cell" literally has the same meaning as the generally used word "prickle cell," indicating the existence of intercellular protoplasmic bridges; these, however, can be seen in a rather small number of epidermoid carcinomata only. The other characteristics given for the "spindle cell" are those of the upper layers of the cervical epithelium. The "transitional" cell type corresponds to the lower layers of cervical epithelium except the stratum germinativum itself. Martzloff makes no statement about their shape and he is right in not doing so. The third group, the "fat spindle cell" is described as a broad spindle-shaped cell. Martzloff immediately adds the remark that the growth would probably be termed basal cell cancer by many observers. True to his merely morphological, not histogenetic standpoint, he avoids the term "basal cell."

Plant concludes that:—

1. We have today no reliable basis for a histological prognosis in cervical carcinoma.
2. The histological picture of cancer of cervix does not permit of establishing well defined groups according to the type of cancer cell.
3. In speaking about malignancy several points must be considered separately especially in relation to the different principles which are active in radiotherapy.
4. The constitutional factors must be considered in determining prognosis.
5. The influence of age must be studied anew since the existing data are unsatisfactory.
6. The clinical classification of carcinoma of the uterine cervix is still the best aid in making a prognosis.
7. The general histological aspect of the tumour may be an aid in prognosis.

Results with the Watkins interposition operation in the treatment of prolapsus uteri.

Brady's study shows that 45 out of 48 patients on whom this operation was performed were completely relieved of all symptoms of procidentia and had no return of the condition. Two patients were not completely relieved of all their symptoms, but on re-examination showed no evidence of procidentia. In one instance, the only known failure in the series, after 10 years the patient began to have further trouble and a cystocele developed.

It is doubtful if a study of a series of cases of prolapsus uteri treated by any of the other operative procedures would show any better end-results, and the fact that the Watkins interposition operation causes the least

shock of any of the operations for the correction of this condition should be emphasized.

Pregnancy after salpingectomy.

Of four cases in which following salpingectomy the resected ovary was sutured into the cornu of the uterus unilateral implantation only being employed, impregnation occurred in one within three months.

Hernia of the ovary.

Moore found the ovary to be the only content of an inguinal hernia, on which a radical cure was performed by a modification of Macewen's method. From the time of the record of this condition by Soranus of Ephesus in 97 A.D. to that of the author 138 cases have been recorded, so that the condition is still uncommon enough to be regarded as a surgical curiosity.

Amputation of the cervix with application of the Sturmdorf principle.

Te Linde performed this operation in twelve cases without post-operative hæmorrhage, the stump becoming smoothly covered with mucous membrane. As its source is removed the cervical leucorrhœa is cured.

F. E. T.

The Journal of the American Medical Association.

Vol. 87, No. 1, *July* 3, 1926.

*Our obstetric and gynecologic responsibilities. G. S. Ward.

Report of a case of double pyosalpinx in a child aged five years. G. R. Burke.

Vol. 87, No. 2, *July* 10, 1926.

The Vitamins in milk. (Current Comment).

Vol. 87, No. 3, *July* 17, 1926.

*Infant feeding. C. G. Grulee.

The umbilical cord. N. W. Vaux and W. Belk

A new clamp of vaginal hysterectomy. R. G. Hendricks.

Vol. 87, No. 4, *July* 24, 1926.

*Present status of the toxæmias of pregnancy. J. O. Polak.

Eclampsia at the Chicago Lying-in Hospital. Immediate and late results. J. P. Greenhill.

*Toxemia of pregnancy: eight hundred and seventy-nine cases with convulsions, at the New York Lying-in Hospital. A. B. Davis and J. A. Harrar.

*Magnesium sulphate intravenously in the care and treatment of pre-eclampsia and eclampsia. L. G. McNeile and J. Vruwink.

Water-driven breast pump. J. A. Abb.

The diagnosis of gonorrhœa by culture. R. B. H. Gradwohl.

Vol. 87, No. 7, *August* 14, 1926.

Infant mortality for 1925. (Current Comment).

Vol. 87, No. 8, *August* 21, 1926.

*The female sex hormone. R. T. Frank and M. A. Goldberger.

"Milk sick". W. E. Walsh.

Vol. 87, No. 9, *August* 28, 1926.

Fluoroscopic visualization of tubal peristalsis. J. C. Rubin and A. J. Bendick.

Foreign bodies in abdomen. J. Buckstein.

Vol. 87, No. 10 *September* 4, 1926.

*Use of colloidal lead in the treatment of cancer. F. C. Wood.

A slight improvement in the technique of intra-uterine packing. P. E. Spangler.

Vol. 87, No. 11, *September* 11, 1926.

*Retrodisplacement of the uterus during pregnancy and the puerperium. W. C. Danforth and C. E. Galloway.

*Puerperal morbidity. H. A. Miller.

*Etiology and diagnosis of intra-uterine fetal death. W. H. Browne and H. L. Kincaid.

Human infection with Brucella melitensis variety abortus treated with mercurochrome. E. E. Gage and D. H. Gregory.

Vol. 87, No. 12, *September* 18, 1926.

Vomiting in infants. D. Greer.

Multilocular tubo-ovarian cysts in juveniles. W. L. Secor.

Closing abdominal wounds. A. H. Rostung.

Vol. 87, No. 13, *September* 25, 1926.

*Thyroid hypertrophy and pregnancy. C. H. Davis.

*Pregnancy complicating exopthalmic goitre and adenomatous goitre with hyperthyroidism. R. D. Mussey, W. A. Plummer and W. M. Boothby.

Relative development of uterus and ovaries. (Editorial.)

Vol. 87, No. 14, *October* 2, 1926.

*The prevention of rickets in premature infants. H. J. Gerstenberger and J. D. Nourse.

Blood tests for paternity. (Editorial).

Vol. 87, No. 15, *October* 9, 1926.

Cauterization and cautery excision of cancer. A study of one thousand cases. A. C. Scott.

A case of intra-uterine amputation. J. M. Reed.

Gye-Barnard organism of cancer. (Editorial).

Vol. 87, No. 16, *October* 16, 1926.

*Meningeal hæmorrhage in new-born. L. V. Blanco and H. Paperini.

Iodized oil and pneumoperitoneum in gynecology. I. F. Stein and R. A. Arens.

Unilateral talipes in twins. E. J. Berkheiser.

Vol. 87, No. 17, *October* 23, 1926.

*Peptic digestion in cows milk. J. H. Hess, E. M. Koch and Z. C. Sennewald.

*The production and handling of human milk. H. D. Chaplin.

*The vaginal douche. S. R. Meaker.

Vol. 87, No. 21, *November* 20, 1926.

*Chronic endocervicitis. C. J. Miller.

*Radium in the treatment of cancer of the cervix uteri. G. E. Ward.

*Five year end results in treatment of cancer of uterine cervix. F. W. Lynch.
*Ethylene in obstetrics. E. D. Plass and C. N. Swanson.
The female sex hormone. R. T. Frank and M. A. Goldberger.
Acid milk and rickets. (Editorial).

Our obstetric and gynæcologic responsibilities.

Ward considers that there is a great need of propaganda to awaken the profession to the fact that obstetrics as generally practiced at present is woefully below the standard that maternity hospitals show, as has been shown by recent studies in maternal mortality, and that it is meet that we should arise to the urgent necessity of sounding an alarm to awaken the man who comes most closely in touch with the life of the people to a sense of his shortcomings and to spur ourselves as teachers to a realization that our instruction is inadequate, and may be deficient in conservatism.

Infant feeding.

Goulee of Chicago considers that :—

1. Seven out of eight babies under six months of age can be fed in whole or in part on the breast.
2. Cereals and vegetables can be used to advantage in feeding infants in the second six months of life.
3. Acid milks are necessary in only one in 300 cases of infant feeding.
4. It may be necessary to substitute for cane sugar some other form of sugar in less than ten per cent of artificially fed babies.
5. There is probably no advantage whatever in the use of proprietary infant foods and practically no indication for their use.

Present status of the toxæmias of pregnancy.

Greenhill believes that the treatment of ante-partum and intrapartum eclampsia should not be entirely conservative or entirely radical. In experienced hands he favours emptying the uterus in most cases, and the method selected depends on the condition of the patient, the size of the baby and the state of the cervix. When the patient is a primigravida with a viable baby, and the cervix is undilated he prefers to terminate pregnancy by a low or cervical Cæsarean section *under local anæsthesia* as soon after the first convulsion as possible. He believes that all patients with eclampsia should be sent to hospital. When a patient must remain at home the treatment should be conservative. It should also be conservative in a hospital where the attending physician is not skilled in operative obstetrics.

Toxæmias of pregnancy.

Davis and Harrar thus summarize their experience in the New York Lying-in Hospital : (1) Eclampsia occurred in 879 cases during a long series of years. (2) The remarkable seasonable influence on the incidence of eclampsia as shown in studies of different groups years apart is borne out in the study of their entire number. (3) The remarkable reduction in the incidence of toxæmia of eclampsia with greatly lowered maternal and infant mortality is due to inadequate prenatal care with conservative treatment and the use of morphine during the attack.

Magnesium sulphate intravenously in the care and treatment of pre-eclampsia and eclampsia.

McNeile and Vruwink of Los Angeles consider the intravenous injection of a 10 per cent. solution of magnesium sulphate to be a valuable adjunct in the treatment of toxæmia of pregnancy. It will cause some reduction of blood pressure, reduce oedema, increase urinary output, and reduce or control other symptoms. It will control the convulsions of eclampsia in nearly every case, and exercises a favourable influence on the other symptoms of eclampsia. It is a safe procedure. Further investigation should be made to determine the relative value of the usage recommended as compared with the lower percentage and larger volume.

The female sex hormone.

Frank and Goldberger use the sex hormone to determine sex in the presence of malformation of the genital organs. The sex was determined by demonstrationg the presence of the female sex hormone in the circulating blood by injecting lipoid extract of the blood into castrated mice and thereby producing a positive (estrual) vaginal spread.

Negative results cannot be considered of definite significance, but positive findings must be evaluated as decisive. This method, they consider, should prove a boon whenever the question of establishing the sex of a person arises and a positive feminine reaction can be obtained. It is naturally not applicable before the age of puberty.

Use of colloidal lead in the treatment of cancer.

Wood states that various colloidal metals are effective in producing recession of animal tumours but that lead seems to be the only one that can be successfully applied to the treatment of primary human tumours. The reason for this is that there is probably a double action comprising not only capillary injury and thrombosis, as is observed with other metals, but also a definite toxic effect on the tumour cells. Any increase in the effect of the roentgen ray is due to the direct toxic action of the lead and not to any secondary radiation from the metallic particles.

Retrodisplacement of the uterus during pregnancy and the puerperium.

From an analysis of one thousand private cases Danforth and Galloway found that 18.8 per cent. had retrodisplacement during pregnancy and the puerperium. Provided an intelligent vigilence is exercised retrodisplacement during pregnancy need cause little trouble. In 29 per cent. of their cases reposition was done and the uterus was retained in position by a pessary, whilst in the remainder correction ensued spontaneously. 14.2 per cent. showed a backward position at eight weeks post-partum. Reposition and retention in the anteflexed position aids the process of involution but does not invariably cure the displacement permanently.

Puerperal morbidity.

These are Muller's conclusions from a statistical presentation of 1,000 cases :—

1. Postpuerperal morbidity occurs much more frequently than is generally supposed. If evenly divided, every postpuerperal woman would be a sufferer in at least one particular.

2. A fully dilated cervix is one that is retracted over the fœtal head and not one that is spoken of as dilatable.
3. Operative deliveries of any character seem to increase the post-puerperal morbidity, and are to be condemned even though we entirely disregard the immediate danger of infection, except where absolutely necessary to preserve the life of mother or child.
4. Temperatures during the puerperal period, even though slight, leave in their wake some definite evidence of injury having been done.
5. The now existing postpuerperal morbidity would seem to justify a return to rational nonintervention in the normal woman and the avoidance of all measures to hasten delivery, except in the presence of fœtal distress, uterine inertia or disproportion.
6. Attention to cervical injuries will markedly lessen the discomfort of the patient, and in cases of erosion may have an influence on decreasing malignancy.
7. Postpuerperal examination should be made after each delivery.

Etiology and diagnosis of intra-uterine fœtal death....

Browne and Kincaid record a case of a clinically healthy mother in whom a fœtus apparently succumbed in utero to a hæmatogenous streptococcal infection.

Vomiting in infants.

From a clinical study of diagnosis and treatment, Greer states that in his experience, congenital hypertrophic pyloric stenosis presents a well-nigh unmistakable picture: fulminating progression of the vomiting, constancy and clear definition of the epigastric peristaltic waves, and the almost invariable resistance to medical and dietary therapy leave little room for conjecture. Palpation of a pyloric tumour is not essential to the diagnosis, and, conversely, does not establish it. Examination by the roentgen ray is only a means of corroboration.

He had yet to see an instance of the so-called mild hypertrophic pyloric stenosis. Nor has he obtained a cure of pyloric vomiting by medical and dietary means in any case in which the diagnosis of congenital hypertrophic pyloric stenosis was not open to serious question. In fact, comparison of the first and second series of cases quoted shows them to have little in common except that severe forceful vomiting occurred with constancy in both, and the latter group showed delayed pyloric passage of food to a degree.

His attitude towards the treatment of congenital hypertrophic pyloric stenosis is that surgical intervention should promptly follow the establishment of the diagnosis.

Thyroid hypertrophy and pregnancy, with data on basal metabolism and the calcium content of the body.

This is a preliminary study. The observations thus far made suggest that, if a woman with a normal thyroid has sufficient iodine during the course of a normal pregnancy, her basal metabolic rate will remain within normal limits, although it may show a slight increase towards the end of pregnancy. Metabolic rates that are well above the normal limits are believed to indicate abnormal function of the thyroid, usually of slight

degree. The return to normal limits within eleven days postpartum, while the rule, does not prove that the increased rate did not signify an abnormal function. These patients should be kept under medical observation for a long time after delivery. Many of the so-called neurotics of the past probably had disturbed thyroid function.

Pregnancy complicating exophthalmic goitre and adenomatous goitre with hyperthyroidism.

In reviewing these cases of exophthalmic goitre and adenomatous goitre with hyperthyroidism associated with pregnancy, one is first impressed with the rarity of the association. It is also noteworthy that serious additional complications were not more frequent than is usual in either condition alone, and that therapeutic abortion was not necessary. Finally, both the course of pregnancy and the maternal and fœtal mortality were not appreciably affected as the result of the syndrome due to exophthalmic goitre or to adenomatous goitre with hyperthyroidism, nor, on the other hand, did the pregnancy render the control of these two diseases noticeably more difficult.

The prevention of rickets in premature infants.

Gurstenberger and Nourse say that it is conceded that premature infants and twins are more susceptible to the development of rickets, spasmophilia and anæmia than are full-time normal infants. As the result of feeding experiments they conclude that :—

1. Rickets can be prevented and cured in premature infants.
2. The amount of cod liver oil required is small, as 3.5 cc. per litre of S.M.A. or S.M.A.-skim milk mixtures prevented rickets in every case, and 2.2 cc. of cod liver oil per litre of Protein S.M.A. was effective in five out of seven. The two that developed rickets on this combination lost it on the same mixture even though they continued to gain in weight, but at a somewhat slower speed. The average daily intake of cod liver oil for the group was 1.76. cc.
3. It was observed that a daily intake of 8 cc. of cod liver oil for one week produced healing of rickets in seven weeks and completely calcified bone in nine, showing again the small amount of cod liver oil required to initiate and for some time to keep in action the calcification process.
4. In preventing rickets in premature infants, cod liver oil should be administered as soon as food is consumed.
5. Excessively rapid and great gain in weight should not be encouraged.
6. The food should contain a higher mineral and protein content than does human milk, and it is suggested that if human milk is used it be supplemented with boiled skim milk.

Meningeal hæmorrhage in the new-born.

Investigating meningeal hæmorrhage in the new-born in Zarate's Clinic in Buenos Aires, Mancho and Paperini found that even in the most desperate cases of meningeal hæmorrhage, a cure is possible in a greater percentage than has been believed up to the present, provided an early diagnosis is made, followed by energetic treatment.

One must consider in the diagnosis, besides the obstetric history, the following clinical symptoms; asphyxia accompanied by dysphagia, bulging of the fontanelle, convulsions, continuous moaning, stupor or coma, opisthotonos, spasm and icterus.

As these symptoms are not pathognomonic and may be absent, lumbar puncture is necessary for the diagnosis; and as this little operation is an indespensable means of treatment of this grave disease of the new-born, they formulate the following law, which must be considered by all practitioners conscientious in their duty, as is the case in the prophylaxis of gonorrheal conjunctivitis.

All new-born infants who may have experienced an obstetric injury or in whose history an infectious or toxic process shall have been observed, capable of producing vascular fragility, must be subjected to lumbar puncture immediately after birth, and if this puncture shows the existence of meningeal hæmorrhage the child should be put under the corresponding treatment.

In the majority of cases of meningeal hæmorrhage the treatment is exclusively medical and consists in the decompressive effect of lumbar puncture and the hemostatic action of normal horse serum, by intraspinal injection. The gelatinous serum by subcutaneous injection must also be employed.

Peptic digestion in cows milk.

Investigating the effect of various modifications employed in infant feeding, Hess, Koch and Sennewald compared various milk modifications commonly used in infant feeding with reference to the rate of gastric digestion to determine the relative importance in the digestion process of the character of the curd and the *p*H. Peptic digestion was carried out in vitro on the various milk modifications and a quantitative determination made of the increase in the soluble nitrogen as a result of digestion. They realized the difficulty of reproducing in vitro the conditions that obtain in the stomach, where there is continuous secretion of acid and enzyme, and where the motility varies with the stage of digestion. It was hoped, however, that such experiments might indicate whether changes in the *p*H or in the character of the curd or in the addition of certain anions produces a real change in the rate of digestion.

Considering the results of in vitro experiments on peptic digestion and in the character of the curds obtained after feeding puppies with various milk modifications, cultured lactic acid milk is superior to all other acid milks. However, orange juice gives the highest total soluble protein. Both orange and lemon juices introduce vitamins, mineral constituents and additional alkaline buffer salts and seem to be the logical choice for continued feeding as additions to raw, pasteurized or boiled milks.

Orange juice is recommended in the amounts of 60 cc. as the maximum to the litre (2 ounces to the quart) of milk, in the mixture.

In younger infants when less than a litre of milk is used in the mixture, the quantity of fruit juice is proportionally lessened. The mixture should be stirred while the fruit juices are being added.

In addition to one of the fruit juices, yolk of raw egg with its high iron and high fat-soluble vitamin content can be added to advantage,

beginning with one-fourth yolk at four weeks of age and increasing to a whole yolk by the fourth month.

When boiled milk is used, fruit juices and egg yolk are added to the mixture after cooling.

The production and handling of human milk.

The production and handling of human milk by the Children's Welfare Federation of New York was begun, October 6, 1921. From that date to May 1, 1926, 5,296 quarts represents the total amount that has been produced and distributed by this agency. For the first three years only one station was in existence, but since then three stations in different sections of the city have carried on the work. The milk is collected only in these stations and none is now accepted unless it is expressed in the station under the eye of the matron in attendance.

The women sit in screened booths and they are thus visible only to to the matron who watches and advises during the progress of the milking. The duties of the matron consist in instructing and supervising the mothers, sterilizing the bottles, keeping records, and filing the orders. Milk is collected at the stations between the hours of 10 a.m. and 3 p.m. Later in the day she goes out to visit new mothers in order to enlarge her clientele.

A specimen of the pooled milk is analysed every month. These show that the fat, protein and lactose are fairly uniform when the milk is thus collected and pooled, and in this way is similar to the herd milk of cows.

This plan of furnishing human milk should come to stay, as it is the only practical way of reducing much of the early infant mortality.

In addition to this accomplishment, an interesting bye-product of the undertaking is the relief of poverty in families in which healthy mothers can easily furnish extra milk and thus aid the family budget. Not a few young mothers, owing to extreme poverty, are obliged to go out to work, which is good neither for her baby nor for herself. This plan affords the opportunity of staying at home looking after her own baby, and at the same time helping another baby in dire straits. It is thus in a broad sense a true community service.

Lying-in and obstetric wards theoretically should furnish needed breast milk, but these institutions usually require any spare milk for their own inmates and are thus loath to undertake any such work. The experience of the federation shows that any baby health station or community health centre can inaugurate and carry on this beneficient scheme. It has demonstrated a plan that can be put in successful operation all through the country.

The vaginal douche.

Meaker points out that the vaginal douche has been a common item of pelvic therapeutics since the time of Hippocrates, and it is extensively used by uninstructed women.

In prescribing douches of any type it is necessary to be most specific about details, the importance of which the patient rarely appreciates. Not uncommonly, for example, one orders long hot douches, only to find on the occasion of the patient's return visit that she became discouraged

over the time and trouble involved and substituted hot douches two or three quarts in volume—the exact physiologic antidote of what was intended.

A douche-bag or can ought always to be used; satisfactory results are not obtained with a bulb-syringe. Ordinarily the bag should hang about two feet above the level of the pelvis, since a stream of great force is not required. The nozzle should be large enough so that there is no possibility of its entering the cervix.

All douches must be taken in the recumbent position, preferably with the hips slightly elevated, for only in this way is the vaginal vault properly flooded. The method adopted by most patients is to lie crosswise on the bed, the buttocks at the edge of the bed and the feet on two chairs, with a rubber sheet underneath the buttocks leading down into a pail on the floor. A regular douche pan will be a wise investment . douche therapy is to be long continued.

Chronic endocervicitis.

Miller considers that endocervicitis is a definite clinical entity of common incidence and grave potentialities, there being no gynæcological condition which is subjected to such misdirected and unsatisfactory treatment.

As regards etiology nearly all types of bacteria may be identified in chronic endocervicitis, but certain types are predominent, namely, the gonococcus, streptococcus, staphylococcus and colon bacillus and mixed infections are not uncommon.

The symptomatology is varied, the most common symptoms being leukorrhœa, sterility, constipation and systemic manifestations. Backache and dyspareunia are not present unless complications arise. The diagnosis presents little difficulty.

The structural peculiarities of the cervix, its frequent exposure to trauma and infection, and its faculty of harbouring bacteria over long periods of time, all emphasize the fact that local, superficial treatment is worse than useless, and that any methods which are to succeed must be directed toward the underlying pathologic change of the deeper cervical structures.

Radium in the treatment of cancer of the cervix uteri.

Ward shows that :—

1. Improved methods in technique have increased the percentage of cures in all groups, with the exception of the borderline. These were regarded as inoperable.
2. Classifying the operable cases in which treatment with radium alone and with radium plus operation, and those in which treatment was prophylactic after operation, as all operable, there was a total of twenty-four patients of whom fourteen were well when last seen. This gives a total clinical cure in the operable class in which operation and radium were used of 58 per cent. This is against 57 per cent. in those in which radium alone was used.

3. That radium is of great value in that class of cases which is hopeless from the standpoint of operation is undisputed.
4. A clinical cure has been realized in forty-seven (20.2 per cent.) of the 232 cases treated, including all classes of cases—operable, operation after radium, recurrent after operation, prophylactic after operation, borderline, radium and cautery and inoperable. Of the patients treated by radium alone, *i.e.*, the operable (not operated on), borderline and inoperable, twenty-eight out of 174, or 16 per cent. are clinically cured.

Ethylene in obstetrics.

Plass and Swanson conclude that :—

1. Satisfactory obstetric analgesia can be obtained with weaker mixtures of ethylene than nitrous oxide. From 25 to 50 per cent. ethylene with air is usually sufficient until the presenting part distends the vulva, when higher concentrations become necessary.
2. Three fourths of all spontaneous deliveries have been conducted under ethylene alone and one fourth of all operative deliveries, whereas with nitrous oxide about one fourth of the spontaneous deliveries and only an occasional operative delivery were conducted without the addition of ether.
3. The incidence of fœtal asphyxia was roughly twice as great under nitrous oxide as under ethylene. Patients who had morphine or pantopon during labour gave birth to twice as many asphyxiated children as did those who were given no such drugs, irrespective of the anesthetic employed.
4. Given as indicated here, ethylene costs only about two thirds as much per patient-hour as nitrous oxide.
5. Nausea and vomiting occurred in 30 per cent. of all patients who were given ethylene alone, and the addition of ether increased the incidence.
6. There was no noticable prolongation of the second stage of labour when ethylene or nitrous oxide was employed. As first stage analgesics, neither gas is free from disadvantages, but, in spite of them, the administration of inhalation analgesia is not absolutely contraindicated late in the first stage, especially in multiparous women, in whom, in more than half the cases, gas has been given before full dilation with no ill effect.
7. Ethylene produced no particular effect on the extent of postpartum bleeding, but the addition of ether to either agent considerably augmented the average bleeding and the incidence of postpartum hæmorrhage. Multiparity itself was a factor in the production of excessive bleeding.
8. No explosions have been observed in approximately 600 ethylene anesthesias.
9. As an anesthetic for obstetric work, ethylene has many advantages over its nearest competitor, nitrous oxide, and should be used more extensively.

F. E. T.

John Hopkins Hospital Bulletin.

xxxviii No. 4. April 1926.

*The Defensive Mechanism of the Parametrium during Pregnancy and Labour. J. HOFBAUER.

Hofbauer noting that "our knowledge is very defective concerning the defensive forces which may be operative in coping with puerperal infection" and after a careful search of the literature had failed to reveal a single reference on the conditions obtaining in the parametrium during pregnancy and labour, carried out a series of investigations on the subject, and arrived at the following conclusion :

During pregnancy phagocytic tissue consisting of monocytes and clasmatocytes makes its appearance in the parametrium and is intensified under the stress of prolonged labour, but particularly by the existence of infection. The development of this tissue from resting-wandering cells and adventitial cells can be demonstrated. The presence of this phagocytic tissue in the parametrium must be regarded as a prophylactic biological reaction and as a marked protection against infection. It certainly affords a mechanism for the development of local immunity in a region abundantly predisposed to infection and must be of service in doing away with débris and bacteria. The mode of its production is not yet clear, but it may have important implications in connection with the questions of auto-infection and low cervical section.

The development of lymphoid tissue within the walls of lymphatics in the parametrium must be regarded as an additional defensive mechanism.

COMYNS BERKELEY.

Bruxelles Médical.

April 18th, 1926.

*Concerning Baldwin's operation. M. Brouha.

Low transperitoneal Cæsarean section. A. Weymeersch and J. L. Woden.

April 25th, 1926.

*Histological researches on the uterine muscle fibres. H. Keiffer.

May 2nd, 1926.

Premature labour induced for pyelo-nephritis. Schockaert.

Treatment of albuminuria of pregnancy. Beckers.

May 16th, 1926.

*Experimental research on the liquor folliculi. L. Brouha and H. Simonnet.

May 23rd, 1926.

Treatment of syphilis in pregnant women. Beckers.

May 30th, 1926.

On the indications for suprapubic Cæsarean section. M. Brouha.

Causes and treatment of sterility in women. Beckers.

June 6th, 1926.

*A case of rupture of the uterus. Nolens.

June 13th, 1926.

*Extra-uterine pregnancy. F. Potvin.

June 20th, 1926.

Calcified ovary: reflexions on sterility. J. L. Henrotay.

July 11th, 1926.

Premature separation of the normally-inserted placenta at six months. Schockaert.

Hysterectomy for complete prolapse in an octogenarian. Schockaert.

Concerning Baldwin's operation.

Brouha reports two operations for the formation of an artificial vagina. The first patient, operated on in 1913, married soon afterwards and has been able to perform her conjugal duties to the satisfaction of her husband and of herself.

Histological researches on the uterine muscle fibres.

Keiffer states that certain changes may be observed in the pregnant uterus, especially in the juxtaplacental zone and in the immediate neighbourhood of the vessels. The muscle cell may assume the appearance of a connective-tissue cell or of a secretory epithelioid cell; it may undergo extreme hypertrophy, or may undergo a more or less complete cytolysis, with the production of glycogen. He believes that all these changes are physiological and suggests that the muscle cell has an endocrine function in addition to its contractile activities.

Experimental research on the liquor folliculi.

Observations were made on guinea-pigs by the method of Stockard and Papanicolaou, who showed that the different phases of the œstrous cycle can be determined by characteristic changes in the vaginal secretion. The active substance employed was obtained from the Graafian follicles of asses. Extraction was performed with 95 per cent. alcohol, petroleum ether and acetone successively, and the final extract dissolved in a hundred times the weight of olive oil. The threshold of activity was about one mg. for animals weighing 150 g. to 170 g.

In immature females, the œstrous cycle was induced: there was no effect on the general development, nor on that of the ovary or mammary gland. In mature females, the œstrous cycle was prolonged, but its periodicity was retained: there was no effect on pregnancy, at least in the later stages: during lactation a cycle could be induced: there was no effect on the mammary gland.

It is concluded that the follicular hormone can be substituted for the endocrine function of the ovaries in the non-pregnant animal. It determines the changes which occur in the genital tract in the absence of pregnancy, and it controls the appearance of puberty and the mating instinct.

Experiments with extracts of corpora lutea and other ovarian products yielded negative results.

A case of rupture of the uterus.

This followed an injudicious injection of pituitrin. Laparotomy was contra-indicated by the presence of goître, bronchitis, cardiac weakness and severe albuminuria. The child was delivered with forceps and the placenta detached with the hand. Both mother and child did well.

Extra-uterine pregnancy.

In one of the cases described, a Fallopian tube contained twin fœtuses.

A. Gough.

La Clinica Obstetrica.

February 1926.

*Contribution to the study of necrosis and suppuration in uterine fibromyomata. D. Ferraccin.

*Acute puerperal inversion of the uterus, and its operative therapy. N. Masieri.

Vagina septa, uterus biforis bicollis, supra simplex. G. Rossaro.

Vesicular mole in twin pregnancy complicated by polydramnios and hydrorrhœa. G. Viola-Puglia.

Genital flux in women; genesis and therapy G. Revoltella.

Gynæcological opotherapy. A. Vassallo.

March 1926.

*A new sero-diagnosis of pregnancy. G. Viola-Puglia.

*The importance of the spleen in resistance to infection, deduced from a case of grave puerperal sepus in a woman recently splenectomised. E. Capecchi.

Tubal pregnancy near term. A. Manna.

A case of chorion epithelioma in a luetic woman. F. Pomini.

The use of hypophyseal extracts. G. Cuzzi.

On the better curability of cancer of the uterus. F. D'Erchia.

A fatal case of postpartum hæmorrhage. N. Rizzacasa.

April 1926.

A modification in the technique of Wertheim's operation necessitated by vaginal prolapse. A. Vignali.

A case of ileus in pregnancy. G. Dellepiane.

Old and new theories on the etio-pathogenesis of malignant tumours. A. Merlini.

Transfusion of blood in medical practice. G. Santoro.

Contribution to the study of necrosis and suppuration in uterine fibromyomata.

Ferracin records three cases and concludes that the puerperium exerts a harmful influence on the evolution of fibromyomata. Slow puerperal involution of the uterus followed by arrest should generally give rise to suspicion of the presence of a tumour particularly a fibromyoma. As they may cause analogous morbid manifestations neoplasms of the uterus and ovaries must be considered in the differential diagnosis. Once necrosis or suppuration has supervened in a fibromyoma the treatment can only be operative, and in large interstitial tumours with purulent softening intervention should be undertaken as early as possible so as to avoid the grave dangers attending probable rupture into the abdominal cavity.

Acute puerperal inversion of the uterus and its operative therapy.

Masieri records a case of acute puerperal inversion in a woman aged 48 who had been delivered five days previously when the midwife attempted to remove the placenta by expression and traction on the cord in an attempt to check postpartum hæmorrhage. Being unable to reduce the inversion by taxis, abdominal hysterectomy was performed. After a stormy convalescence the patient recovered.

A new sero-diagnosis of pregnancy.

Viola-Puglia finds the reaction of Dienst as modified by Dallera, almost constantly positive in the first three months of pregnancy.

The importance of the spleen in resistance to infection deduced from a case of grave puerperal sepsis in a woman recently splenectomised.

In Capecchi's case a woman aged 28 had a severe attack of septicæmia during which a non-hæmolytic, short-chained steptococcus was cultured from the peripheral blood, and recovered after the subcutaneous injection of electrargol and polyvalent anti-streptococcal serum, notwithstanding absence of the spleen which had been recently removed on account of rupture. F. E. T.

Annali di Ostetricia e Ginecologia.

June, 1926.

*Distribution of total nitrogen excreted in the urine during the puerperium. Rivoltella.

*Uterine inertia and the sympathetic nervous system. F. Clauser.

Sterility and mechanical dysmenorrhœa. O. Viana.

July, 1926.

*Investigations on the colloidal state of the serum in the blood of the mother and her newly-born child. G. A. Brossa and S. Tocchi.

*Tertiary syphilis of the internal genital organs and extra-gravid decidual reactions of inflammatory origin. G. Truffi.

August, 1926.

Results of clinical experiences with Kielland's forceps. G. Dossena.

*Spinal anæsthesia : Clinical statistics of 434 cases. G. Coen.

Leucocytic formulæ in gynæcological affections. E. Forti.

Leucocytic formula and Arneth's neutrophil formula in diathermy applied to gynæcological lesions. E. di Francisco.

Distribution of total nitrogen excreted in the urine during the puerperium.

Rivoltella publishes the results of clinical investigations of the amounts of ammonia, amino-acids, and uric acid excreted in the urine :—

1. of normal non-pregnant women on a mixed diet.
2. of women during normal pregnancy on mixed diet.
3. during the puerperium.

(*a*) He finds that the elimination of ammonia and its ratio to total nitrogen excreted is almost the same in normal non-gravid and gravid -patients. During the -puerperium -there is an absolute increase in the excretion of ammonia of about 40 per cent., but the quotient $\frac{NH_3N}{\text{Total N}}$ is diminished almost immediately after parturition, and continues for a few days, finally leading to the normal quotient.

(b) The excretion of amino-acids is increased during pregnancy by about 43 per cent. During the puerperium there is a retrocession in their elimination to the average in about ten days.

(*c*) There is an absolute diminution in excretion of uric acid during pregnancy, but an increase in its excretion relative to total nitrogen excreted. The contrary takes place in the first days of the puerperium.

Uterine inertia and the sympathetic nervous system.

As the result of five years clinical observation and investigation of cases of uterine inertia. Clauser thinks that the causes to which the condition is theoretically attributed are not of frequent occurrence. In only a minority of his cases could uterine inertia be ascribed to uterine hypoplasia, hydramnios, previous cicatrices etc. It was often difficult to explain why labour in a young and healthy woman with a normal pelvis and a normal fœtus should drag on hour after hour because of inertia.

It is a question whether distention of the bladder or rectum, sometimes regarded as causal, is not an accompanying symptom, and whether the atony of each system is not a partial manifestation of inhibition or stimulation of the vagus or sympathetic.

Possibly the two chief factors in inertia are alteration in the endocrinal apparatus, and in the vegetative nervous system. Probably the sympathetic is the first system which responds to endocrine disturbance.

One of the phenomena which induced the author to study the nervous affection was the occurrence of glycosuria after injection of adrenalin, which condition he attributed to hyper-excitability of the sympathetic.

He considered that the changes in the sweat glands and in the vascular system during pregnancy and the puerperium also seemed due to changing stimuli of the vegetative nervous system.

To ascertain the nature of these changes, he made two sets of experiments, during the early puerperium: (1) in 15 normal cases, and (2) in 23 cases of simple uterine inertia. In 15 normal cases, only two gave a *neutral* reaction after injections of pilocarpin or adrenalin. Five cases responded energetically to pilocarpin, feebly to adrenalin. He classifies these as *vago-tonic*,. The remaining eight responded equally to pilocarpin or adrenalin. He considers these of *mixed* type.

In the 23 cases of uterine inertia only one was vago-tonic in type, three were "mixed," whilst 19 presented a "neutral" reaction. Therefore the "neutral" reaction, which constitutes an exception in the normal puerperium, seems to become the rule in the puerperium following uterine inertia at term.

Another fact which merited attention was that the dermograph (skin reaction of abdomen or breasts) was usually white in normal cases, and red in those of uterine inertia.

The author considers the latter reaction an indication of hypo-tonicity of the sympathetic.

Investigations on the colloidal state of the serum in the blood of the mother and her newly-born infant.

The authors refer to Fischer's work, published in 1922-23, regarding the physical equilibrium of proteins in the blood, and the possibility of diagnosing tuberculosis, tumours or pregnancy, from the behaviour of blood serum in presence of certain co-agulating agents, such as alcohol added to a two per cent. solution of gelatine.

In physiological conditions, globulin exercises a protective action on albumen, whatever be the proportion between the two proteins.

Amplifying Fischer's experimental work, the authors have applied it to investigate characteristic differences in the serum of the pregnant woman at term, and that of her newly-born infant.

Brossa and Tocchi determined the quantity of gelatine necessary to produce distinct flocculation with a certain definite quantity of alcohol. In four test-tubes, 0.2 c.c of maternal serum were put, and in other four, the same quantity of fœtal serum; then a two per cent. solution of gelatine was added in increasing proportions to each tube :— 0.4 c.c. up to 1.0 c.c. After shaking the tubes, 0.5 c.c. of absolute alcohol was added to each.

In the first four tubes, complete flocculation was obtained in one and two, partial in three, and turbidity in four. The fœtal serum showed flocculation in the first, eventual turbidity in the second, but remained limpid in the third and fourth.

It was noted that instead of the protective action they usually exert, gelatine and other proteins in colloidal mixtures sometimes play the opposite rôle of sensitisation. Alcohol alone causes a varying degree of flocculation, but this is so massive that that it cannot be estimated. Hence, the expediency of employing gelatine.

The authors' confirm the experiences of Fischer. Differences concern only the mechanism of the reaction and the explanation given by Fischer of the mode of protection afforded by gelatine.

Tertiary syphilis of the internal genital organs and extra-gravid decidual reactions of inflammatory origin.

Truffi describes the manifestations of uterine, ovarian, and tubal syphilis research, which especially on the latter two affections is relatively scarce.

The stages of uterine syphilis are classified as : (1) a period of syphilitic arteritis where the only symptom is metrorrhagia; (2) hypertrophic uterine sclerosis,—symptoms, metrorrhagia and pain; (3) atrophic uterus—an infantile uterus with cicatrical retraction of parametrium and fornices. To the preceding local symptoms,are added general weakness and loss of flesh

Later, the following anatomico-pathological changes occur :—

(*a*) Uterine and tubal sclerosis.

(*b*) Angio-sclerosis of the uterus, Fallopian tube and ovary.

(*c*) Cystic sclerosis of the ovaries.

(*d*) Gummatous manifestations in the Fallopian tube.

Of interest, is the contemporaneous presence of a decidua-like reaction involving the tubal wall, in which are found gummatous processes, and, (excluding the co-existence of pregnancy) the presence of luteinic products, either organized corpus luteum, or scattered lipoidal cells of follicles. The decidua-like cells may be derived from cystic elements due, generally, to inflammation but particularly to syphilitic granulomata.

Spinal anæsthesia : clinical statistics of 434 cases.

After citing favourable results described by many authors, Coen gives his experiences of 475 major or minor operations under spinal anæsthesia. Scopolo-morphine was injected one and a half hours before operation, the patient being kept in a quiet and dark room till operation. The most reliable anæsthetic was Merck's hydrochloride of cocaine.

Of the 475 cases of spinal anæsthesia, the anæsthetic proved insufficient in only 41 cases (3 per cent). In the remaining 434, no serious incident

occurred during or after operation, *i.e.*, in 97 per cent. Of these about four per cent. suffered from post-operative retention of urine and prolonged headache, but only the second symptom can be attributed to the mode of operation.

He concludes that spinal analgesia, with the technique described, has few disadvantages compared with its universally recognized advantages, and has scarcely any contra-indication. He considers it superior to any general anæsthetic, which often injures important organs and leaves the patient in a different condition from that after spinal anæsthesia, in which convalescence is rapid, and is not marked by any adverse symptoms.

J. H. Filshill.

Archiv für Gynäkologie.

Vol. cxxix, No. 2 *September* 2nd, 1926.

A statistical study of the length and weight of the newborn. E. Wehefritz.
Distention of the placenta by the Mojon-Gabastou method. J. Wieloch.
A large cyst of the uterus. E. Pribram.
Spasmophilia of pregnancy. G. M. Schpoljansky.
*The significance of the ovarian arteries in connection with *post-partum* hæmorrhage, and especially with compression of the aorta. G. Haselhorst and W. Schilling.
Physiology of mammary secretion. R. Dyroff.
The regulation of the blood sugar during pregnancy, labour and the puerperium, together with a contribution to the study of hepatic damage and renal diabetes during pregnancy. K. Herold.
Proliferation of cervical glands in the vagina after hysterectomy. J. Halban.
*Pregnancy in the portio vaginalis cervicis uteri. P. Schneider.
*The origin of ovarian hæmotomata. O. O. Fellner.
Physiology of respiration during pregnancy. E. Klaften and J. Palugyay.
Endometrioid tumours in the parametrium. P. Schiller.
Birth mechanism in contracted pelvis. P. Schumacher.

The significance of the ovarian arteries in connection with post-partum hæmorrhage, and especially with compression of the aorta.

X-ray examination after application of Haselhorst's aortic compressor shows that the upper margin of the pelotte is on a level with the lower third of the second lumbar vertebral body; deviations upwards or downwards to the extent of half a centrum are encountered especially in cases of spinal deformity. Dissection in fifty cases showed that in 45 per cent. the ovarian arteries spring from the aorta at the level of the lower third of the second lumbar vertebra. In about one third of the cases one or both of these arteries leave the aorta above the level of pressure of the clamp and occasionally the right ovarian artery springs from the renal artery. The occurrence of an angle between the aorta and the ovarian artery at its origin, so acute as to permit compression of an ovarian artery arising above the level of the pelotte is extremely rare It is concluded that the persistence of bleeding in some cases after aortic compression is not dependent on the blood flow to the uterus by the ovarian arteries, and that the uterine artery itself is not empty of blood : probably the effect

of the instrument in arresting hæmorrhage is due (1) to the great diminution of the blood supply to the uterus, leading to relative anæmia which induces (2) reflex contraction of the myometrium. After aortic compression bleeding is little modified during vaginal operations; in abdominal operations hæmorrhage from a cut uterine artery, although no longer pulsating, may frequently be considerable.

Pregnancy in the portio vaginalis cervicis uteri.

This is described as the first authentic report of primary implantation of an ovum in the portio vaginalis. The patient, a 2-para aged 27 years, had somewhat severe continuous bleeding for several days; the preceeding menstrual periods had been regular, although the first one following conception (this was known to have occurred a little over two months previously) was less copious than usual. The pre-operative diagnosis was ordinary uterine abortion, but the ovum, surrounded universally by chorionic villi, was implanted in, and had eroded, the cervix, which was greatly thinned out below and laterally. The greatest length of the ovum was three centimetres and the uterine sound passed nine centimetres.

The origin of ovarian hæmotomata.

A criticism, based on numerous studies of animal ovaries, of Sampson's and other observers' ascription of an endometrial origin to certain ovarian hæmatomata. Not all the published microphotographs show the epithelial cells of the endometrium-like glands to resemble those of the uterine glands in adult life. In non-menstruating animals (rabbits, guinea-pigs and mice) which are not sexually mature, typically uterine gland formations are not to be found, although occasionally in mature animals glands occur which are lined by epithelium resembling that of the endometrium of immature animals. Such glandular formations as are encountered appear to rise from the cœlomic cells covering the ovary or the cœlomic cells of the rete. In animals in which menstruation has been artificially induced by lipoid injections the ovaries show general hyperæmia and some follicular hæmorrhages as well as hæmorrhages in the glands derived from the rete, intraglandular hæmorrhage alone is no evidence of endometrial origin. In sows, which are said to menstruate under hormone influence, the ovaries show (1) glands developed from the ovarian epithelium which resemble an intermediate stage between immature and mature uterine glands; (2) glands developed from the rete which resemble the mature as well as immature uterine glands. Glands of the second variety resemble very closely those of some of Sampson's figures. Fellner confirms the view of Robert Mayer, *viz.*, that so-called endometrial glands are derived under the influence of a hormone from ovarian epithelium.

W. E. Crowther.

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*Confirmation of Werboff's teaching on the normal work of the uterus during labour. N. Tschistiakoff.

*The clinical reaction as a criterion of the therapeutic effects of milk injections in inflammation of the female genital organs. W. Butomo.
*On the use of menstrualin in dysmenorrhœa. W. Freese.
*The indications for the various methods of operation for retroflexion of the uterus. W. Feldmann.
*The diagnositic value of bilirubinæmia in pregnancy. A. Mandelstamm and L. Nogeikoff.
*Peritonitis and extrauterine pregnancy. G. H. Schneider.
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History of the use of gloves in surgery. E. Ebstein.

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*Prophylactic division of the perinæum in the mid line during labour. D. v. Ott.
*Physiological considerations in gynæcology. W. Dick.
*Calcium treatment in gynæcology, with special reference to hæmosistan. W. Braun.
*Disturbances of digestion (gastric atony and constipation) as the chief cause of abnormal uterine hæmorrhage. A. W. Bauer.
*X-rays as an aid to diagnosis in gynæcology. J. Rosenblatt and S. Kass.

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*Toxæmias with the findings of pernicious anæmia. H. Offergeld.
*On uterine calculi. M. Esser.
*The origin of fœtal inclusions, complicated dermoids and teratomata and their mutual relationship. M. Budde.
*The significance of determination of blood groups for transfusion. W. Baer.

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*Gwathmey's anæsthesia. E. Martin and K. Jackle.
On a hysterical phenomenon of the sexual life of a woman, the so-called globus abdominalis. J. S. Galant.
*On the rate of growth of carcinoma of the cervix. E. Weinzierl.
The production of emphysema in asphyxia neonatorum. E. Poeck.
*The effect of insulin on the weight curve of premature and weakly infants. A. Mahnert.
Congenital contracture of the knee-joint. H. Brandt.

Innervation of the uterus, illustrated by a case of labour after a transverse lesion of the spinal cord.

The patient had a fracture of the first lumbar vertebra with compression of the cord; when she subsequently became pregnant, she was delivered normally at term; she was aware of fœtal movements and of labour pains. Gerstmann, after reviewing previous reports, concludes that the motor control of labour lies in the pelvic ganglia, and that sensation of fœtal movements passes into the cord between the mid cervical and lower lumbar region, while the painful stimulus of labour enters the cord between the fifth lumbar and second sacral segments.

Confirmation of Werboff's teaching on the normal work of the uterus during labour.

Tschistiakoff strongly supports Werboff's teaching on the peristaltic action of the uterus in the presence of any foreign body, such as fœtus, placenta, lochia etc. Peristalsis consists of alternate contraction of longitudinal and circular muscle fibres, the former predominate in the first stage, the latter in the second stage of labour. The author has confirmed these facts by measuring the height and width of the uterus repeatedly during labour. The uterus first becomes shorter and broader, but when the circular fibres come into action it becomes longer and thinner, the fundus often disappearing under the costal margin.

The clinical reaction as a criterion of the therapeutic effects of milk injections in inflammation of the female genital organs.

Butomo concludes that the leucocytic changes in the blood and partly also the fibrile reaction are not independent phenomena but stand in close relation to the general reaction of the given organism. They indicate the course of this non-specific reaction, and can, therefore, be used as a means of judging the result of the milk injection on the pathological process.

On the use of menstrualin in dysmenorrhœa.

Menstrualin, a preparation of yeast in chocolate tablets, has given Freese good results in cases of dysmenorrhœa of all types. Two to three tablets should be given thrice daily for four days, before and also during menstruation. Possibly its action is due to its high vitamin content.

The indications for the various methods of operation for retroflexion of the uterus.

Feldmann describes two cases, in one of which a volvulus followed a Baldy-Franke operation for retroflexion, and in the other, premature labour and a transverse presentation respectively produced two still births after ventral fixation. He affirms that the Alexander Adams operation is always successful provided suitable cases are chosen; where any adhesions fix the uterus, laparotomy is essential, and shortening the round ligaments is best performed anteriorly rather than by drawing them through the broad ligaments to the posterior surface of the uterus as in the first case described. He condemns ventral fixation as unphysiological and dangerous.

The diagnostic value of bilirubinæmia in pregnancy.

Mandelstamm and Nogeikoff summarise their results as follows:—

1. 80 per cent. of normally pregnant women showed increase of bilirubin in the blood. (84 per cent. in the first three months.)
2. In hyperemesis gravidarum, tubal abortion and recent uterine abortion, the reaction was positive.
3. Healthy non-pregnant women gave negative tests with one exception.
4. A weak positive result was obtained in 12 per cent of inflammatory gynæcological cases.
5. The lowered surface tension of the urine found during pregnancy bears no relation to the increase of bilirubin in the blood.
6. Blood from the umbilical cord did not always show an increased value, but all cases showed a higher value than the mother's blood.

Peritonitis and extrauterine pregnancy.

The course of a peritoneal infection depends on the interaction of the

following conditions :— (*a*) As regards the virulence and nature of the infection, a distinction must be made between bacteria normally present in the bowel, gonococci from the genital tract and pyogenic organisms from the exterior. (*b*) The local anatomical condition in the abdomen plays the largest part. (c) The constitution of the blood as regards protective mechanisms is only of secondary import.

The inflammation which so often precedes an extrauterine pregnancy assists in localising the pelvic peritonitis; and so leads to a good prognosis. This is a point which supports the inflammatory theory of extrauterine pregnancy rather than that of tubal anomalies.

A rare case of sarcoma of the vagina.

The patient had an early growth of the posterior vaginal wall which was not visibly malignant, but had caused discharge and slight persistent hæmorrhage. A microscopic examination showed a sarcoma, and further operative and radium treatment led to a cure which is still apparently complete eighteen months later.

Operations for dependent breasts and abdomen.

Küster reviews the various plastic operations which have been devised to correct these conditions, and recommends their use in suitable cases. The breast may require partial excision as well as suspension; the latter is best accomplished by a flap extending from the upper inner quadrant.

The influence of menstruaton on the stability of the colloids in the plasma.

Eufinger finds a diminution of the stability of the blood colloids during menstruation, especially marked in cases where any inflammatory condtion is superimposed.

Prophylactic division of the perinæum in the mid line during labour.

v. Ott has used this method for many years for all primigravidæ and for multiparæ who have a scarred perinæum from a previous laceration. He considers the procedure saves the rupture and separation of individual muscle fibres and renders the subsequent suturing with fine silk easier and stronger; the second stage of labour is often shortened by this treatment. He has had no ill effects, even where the sphincter ani was divided, as good asepsis produced healing by first intention in 97.8 per cent of cases.

Physiological considerations in gynæcology.

Dick traces the change from the purely anatomical study of gynæcology through endocrinology and the doctrine of the constitution to the psychological standpoint. He considers the latter essentially important and points out the predominant use of hypnosis.

Calcium treatment in gynæcology, with special reference to hæmosistan.

Braun has had good results from the intravenous use of hæmosistan (a compound of calcium chloride and ethylenediaminacetate) in such conditions as abnormal hæmorrhages of puberty and the menopause, and inflammations of the adnexa.

Disturbances of digestion (gastric atony and constipation) as the chief cause of abnormal uterine hæmorrhage.

Bauer believes that many changes in the uterine mucous membrane leading to hæmorrhage and leucorrhœa depend on hyperæmia, and that

this in turn is often due, apart from such causes as sedentary occupation, to digestive disturbances especially constipation and dilatation of the stomach. He has repeatedly found that successful treatment of these gastrointestinal conditions alone has cured abnormal uterine hæmorrhage. His treatment consists of small dry meals of an appetising description with the free use of coffee, abdominal and open-air exercise, hydrotherapy and care of the abdominal wall after pregnancy. Constipation is best treated with such foods as prunes or sour milk, or with Glauber's salts, avoiding such aperients and injections as cause intestinal hyperæmia.

X-rays as an aid to diagnosis in gynæcology.

According to Rosenblatt and Kass, X-rays are a most valuable diagnostic aid in gynæcology. They are quite harmless if used aseptically and can be applied to out-patients. Lipiodol is injected into the uterine cavity, and at least two plates should be taken at intervals of five minutes, when the exact condition of the genital tract can be seen, the method is of more use and greater accuracy than insufflation of the Fallopian tubes.

Toxæmias with the findings of pernicious anæmia.

In regarding the type of pernicious anæmia found in connection with pregnancy as a separate entity with a toxic origin, Offergeld brings out the following points. A constitutional condition with changes in the internal secretions underlies both forms, in the true pernicious form this is all that precedes the onset. In the toxæmic form the blood system has been previously diseased and is, therefore, affected by the physiological changes of pregnancy with its increased formation of amines. The toxic form also tends to cure either before or after delivery. The colour index is less high than in the true. The fœtus is unaffected. Induction of labour may remove the source of the toxins, but is uncertain in its results, and should only be employed where rapid advance occurs in spite of medical treatment.

On uterine calculi.

A large abdominal tumour in a woman of 86, which had been diagnosed as a lithopædion, was shown post-mortem to consist of calcified myomata. Though weighing six kilogrammes they had caused no symptoms other than a few profuse hæmorrhages. The tumours were of different types, and showed clearly the varieties of calcification, a pedunculated one being enclosed in concentric layers and a large sessile cervical mass showing a central coral-like distribution. Esser points out that calcification only follows necrosis from an inadequate blood supply where sufficient connection with body fluids remains for calcium to infiltrate the degenerated areas.

The origin of fœtal inclusions, complicated dermoids and teratomata and their mutual relationship.

Budde does not believe internal teratomata to be due to inclusion of part of a coeval twin, but considers their origin to be later and due to separation of a small part of the primitive streak, which forms a subsidiary growth controlling centre, and consequently leads to abnormal irregular growth. The apparent absence of germ cells may possibly be due to their very early isolation, which may have occurred before the separation of the primitive streak fragment.

The significance of determination of blood groups for transfusion.

After emphasising the importance of exact group determination before blood transfusion, Baer affirms the constancy of each group, and the Mendelian inheritance of each group, pointing out that the dominance may be of use in deciding paternity. He suggests that differences in the groups of mother and fœtus may be a factor in causing toxæmia, a point which he is now investigating further. He favours the Nürnberger three drop method of testing a possible donor, followed by Percy's paraffin method of transfusion.

Gwathmey's anæsthesia.

Martin and Jäckle conclude that Gwathmey's rectal anæsthesia during labour is not suitable for general use, as they have met with numerous ill effects, including weakened pains, absence of voluntary efforts necessitating the use of forceps, intestinal irritation or even hæmorrhage, and death of the child from ether anæsthesia or bronchitis.

On the rate growth of carcinoma of the cervix.

In one of Weinzierl's cases a wedge taken from an apparently innocent cervix showed commencing carcinoma and when the patient returned nine days later, a cauliflower mass was found hanging from the anterior lip of the cervix; here the excision of a wedge had presumably led to the rapid extension of the growth. In the second case, three weeks after delivery—normal except for moderate ante-partum hæmorrhage,—a pedunculated sloughing hæmorrhagic carcinoma was found projecting from the vulva and was removed by division of its stalk. A subsequent Wertheim operation showed no extension into the uterus.

On a hysterical phenomenon of the sexual life of a woman,—the so-called globus abdominalis.

The patient was a young married woman who had a somewhat infantile genital tract, but had menstruated normally previous to the birth of twins, following premature delivery she had amenorrhœa and complained of a lump, which swelled up from her pelvis to her ribs causing much pain. The only organic foundation for this was a right öophoritis, which presumably accounted for both symptoms in a hysterical patient.

The effect of insulin on the weight curve of premature and weakly infants.

The post-natal loss of weight of weakly infants was minimised by Mahnert by giving one or two units of insulin, with or without glucose, and the subsequent gain in weight was steady. Loss of weight in slightly older children could also be corrected. These effects were attributed to the retention of water and to the increased appetite due to increased metabolism.

DOROTHY N. L. LEVERKUS.

Münchener Medizinische Wochenschrift.

No. 27, *July* 2, 1926.

*New investigations on sex determination. W. Goetsch.

Contributions to forensic midwifery. H. Hofmeier.

No. 29, *July* 16, 1926.

Investigation of freckles in Siemen's method of diagnosing uni-ovulity. E. Decking.

No. 31, *July* 30, 1926.

Tuberculosis in sucklings and children. Oberndorfer.

The influence of the thermal waters of Bad Gastein on the development of frogs' eggs and larvæ. Schneyer.

*Criminal abortion with soap solution. O. Polano.

No. 33, *August* 13, 1926,

*Ileus and pregnancy. v. Mikulicz-Radecki.

No. 35, *August* 27, 1926.

*Constriction grooves on the skull of the new-born from rigidity of the os. A. Mayer.

No. 36, *September* 3, 1926.

Insulin in vomiting of pregnancy. H. Seidl.

No. 38, *September* 17, 1926.

Fundamental questions on heredo-biological investigation of twins. v. Verschner.

Progress in the treatment of cancer. E. Opitz

Proof and registration of active movements of the portio. H. Hinselmann and H. Korralus.

No. 39 *September* 24, 1926.

Clinical experiences of puerperal gas-bacillus infection. M. Lehmann.

Contributions to forensic midwifery. M. Hofmeier.

Progress in the treatment of cancer. E. Opitz, K. Forlaender, and H. Jung.

New investigations on sex determination.

As the result of experimental investigations on fresh water polyps, Goetsch could find no definite cause for sexual differentiation.

Criminal abortion with soap solutions.

Polano considers that intra-uterine injections of soap solutions are being used more frequently as abortefacients. He stresses the irritant nature of the soap solution and should any gain access to the abdominal cavity peritonitis rapidly ensues. He therefore advocates early laparotomy if there is any suspicion that soap soluion has entered the peritoneal cavity, which should be thoroughly irrigated with large quantities of normal saline solutions. Lacerations of the uterus call for hysterectomy.

Ileus and pregnancy.

v. Mickulicz-Radecki reports two cases of ileus in pregnancy. He considers laparotomy to be the therapy of choice, so that the cause of the ileus can be ascerained. If a true pregnancy ileus be found, the uterus should be emptied forthwith. For an ileus of other causation the pregnancy may be allowed to proceed, though in the later months of pregnancy this may be technically impossible.

Constriction grooves on the skull of the new-born from rigidity of the os.

For such cases Mayer recommends rectal examination and the employment of the Schatz-Unterberger Grip.

F. E. T.

Zentralblatt für Gynäkologie.

No. 14, *April* 3, 1926.

Fifty years of the Zentralblatt für Gynäkologie. W. Stoeckel.
*Rectal versus vaginal examination. F. Baumm.
Carcinoma of the uterus. A. Döderlein.
Lack of care or of skill. F. Engelmann.
Chlorosis and anæmia of pregnancy. P. Esch.
Carcinoma of the cervix. L. Fraenkel.
The duration of pregnancy. O. v. Franqué.
Drainage of the ureter after operation for vesicovaginal fistula. H. Fuchs.
*Retroflexion and accident. H. Füth.
*A sign of probable pregnancy. C. J. Gauss.
Ovaries and uterine hæmorrhages. M. Henkel.
The treatment of eclampsia. T. Heynémann.
Bearing down efforts of the parturient. O. Hoehne.
Tuberculous contracted bladder. R. T. v. Jaschke.
Prolapse of vesical ureterocele. F. Kehrer.
Collapse after obstetric hæmorrhage. F. Kermauner.
Minor gynæcology. A. Mayer.
Tuberculosis in pregnancy. C. Menge.
Changes in gynæcology. E. Opitz.
Implantation of the ovum. O. Pankow.
Training in obstetrics. K. Reifferscheid.
Pfannenstiel's transverse incision. O. Sarwey.
Backache. R. Schröder.
The biliary system in pregnancy. L. Seitz.
Unilocular ovarian cyst. H. Sellheim.
Kielland forceps. M. Walthard.
Obesity and the ovaries. H. Wintz.
Fœtal sounds in the first stage of labour. Zangemeister.

No. 15, *April* 10, 1926.

Obituary notice of Karl Reifferscheid. W. Stoeckel.
Obituary notice of John Barsony. Tauffer.
*The relation between the fœtal and maternal blood sugar. T. Révész and M. Turolt.
Diagnostic and therapeutic experiences of pertubation. M. v. Scheller.
On oligohydramnios. K. Vorlaender.
On the therapy of habitual and premature interruption of pregnancy and habitual fœtal death. J. Novak.
On missed labour. L. Stolper.
A primary abdominal pregnancy. V. Waehneldt.
Tentorial tears in a Cæsarean section child. B. Tunis.
Observations on Henkel's work. "A critical word on modern publicity." in *Zent. f. Gyn.*, 1926, No. 7, p. 391. T. Johannson.
Intraperitoneal hæmorrhage in chorionepithelioma of the uterus. W. L. Butomo.

No. 16, *April* 17, 1926.

Obituary notice of Alwin Mackenrodt. H. Mackenrodt.
New observations and extensions of the operation for bifid uterus. J. P. Strassmann.

On the work of Fuchs : the metroplastic of the bifid uterus. Puppel.
On the course of labour in gastroschisis (fœtal eventration) with spinal curvature in the child. B. Ottow.
*Post-climacteric hæmorrhage and granulosa-cell tumour of the ovary. J. Schiffmann.
*The vaccine therapy of gonorrhœa in women. F. Wolff.
*Acid reaction of the vaginal secretion in gonorrhœa. E. Stengel.
The problem of the cure of discharge. H. Rösch.
Forceps for Herff's clamps. E. Bors.
A new umbilical clamp. S. Sztehlo.
A new rule for midwives in Austria. P. Kompert.

No. 17, *April* 24, 1926.

Sarcoma of the sacrum as a complication of labour. L. Lederer.
Abolition of pain during labour after Gwathmey and a modification of the method. A. Ecke and R. Taubert.
Intravenous injections of morphine for the alleviation of labour pains. O. Aufermann.
*My method and technique of anæsthesia in the treatment of abortion and other minor vaginal manipulations. P. Gellert.
On the question of acceleration of the commencement of labour at the end of pregnancy. F. Stahler.
Laceration of vessels in insertio velamentosa before rupture of the membranes. G. Frommolt.
Spontaneous rupture of the uterus in the fourth month of pregnancy. P. Schugt.
On the statistics of operations for prolapse and retroflexion. G. Halter.
Further cases of extra-uterine pregnancy. W. Liebe.
A case of fatal impalement. K. Burger.

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A congenital cyst of para-urthral (prostate homologue) origin in the newborn and on congenital vestibular cysts in general. B. Ottow.
Urethral plastics. K. v. Lehoczky-Semmelweis.
Vesico-vaginal fistula operation in the manner of Bassini's aponeurosis plastic. R. Freund.
Pedunculated fibromyxoma of the urinary bladder. A. Saturski.
Critical remarks on the treatment of post-operative ischuria. O. Gragert.
Bladder disturbances from urotropin. O. Gragert.
Bladder disturbances from sodium bromide in cystoradiography. B. Ottow.
Cystitis grangrænosa dissecans. F. Lemperg.
A case of cystitis gangrænosa in the puerperium. M. Karlin.
Ureteral forceps. H. Küstner.
The recognition of ureteral insufficiency in pregnancy. G. Frommolt.

No. 19, *May* 8, 1926.

Hæmorrhagic infarction of the uterus and adnexa from thrombosis of the abdominal aorta and the pelvic arteries. F. Danisch.
Chemical age-changes in the placenta. B. Bienenfeld.
*The treatment of septic puerperal fevers with large amounts of alcohol per os. H. Küstner.
Histological state and prognosis in carcinoma of the cervix, with remarks on the conception of malignancy. A. Plant.

*Adhesions in the cervix uteri after curettage. F. Wolff.
*Conservative treatment of febile abortion by drainage. G. Schwarz.
The continuence of pregnancy in spite of commencement of artificial abortion after clearing the uterus and iodine injections. S. Weissenberg.
Consideration of Roessle's work "The statistics of legalised abortion." A. Meidermayer.
The technique of tracheal catheterisation. L. Zorn.
Avoidance of rupture of the membranes. J. Brock.

No. 20, *May* 15, 1926.

Diagnostic experiences with interferometry. H. Runge.
Remarks on Temasvary's work on the influence of thymus extracts on the functions of the uterus and its practical application in midwifery. H. Knaus.
Physiology of the Fallopian tube. III. Observation and registration of the movements of rabbits' tubes through an abdominal window. F. v. Mikulicz-Radecki and W. Nahmmacher.
Papyraceous twins in a triplet pregnancy. P. Wolff.
On intravenous pituglandulin injections in their diagnostic, didactic and therapeutic aspects. W. Zorn.
Hæmorrhage in the eighth month of pregnancy from rupture of an aneurysm of the splenic artery. H. Saenger.
On the mechanism of central perineal ruptures. E. Sachs.
Vaginal operations. W. Pfeilsticker.
The technique of utero-vaginal tamponade. J. A. Beruti.
On v. Ott's "Method of proving tubal pregnancy." F. Lemperg.

No. 21, *May* 22, 1926.

Obituary notice of Siegred W. Flatau. M. Simon.
Physiology of the Fallopian tube. IV. Röntgenographic representation of the rabbits' tube and the results obtained by this method. F. v. Mikulicz-Radecki, W. Lueg and W. Nahmmacher.
Ovarian changes in menstrual anomalies resulting from chronic infectious diseases. H. Hartmann.
Primary hymenal carcinoma. O. Gerich.
On the question of ectopic decidua. O. Brakemann.
Vagina and perineum splitting for avoidance of prolapse. C. Bucura.
An unusual abortion injury. R. Schreiner.
Remarks on Paul Rissmann's article "'Is leaving the decidual rests a blameless proceeding?" E. Löwenstein.
On staphylo- and strepto-yatren in the treatment of puerperal infection. E. Scherer.
On the bleeding time in gynæcological diseases. H. Bock.
Contribution to the therapy of "metropathia hæmorrhagica". G. Baksch.

No. 22, *May* 29, 1926.

Obituary notice of Theodor Wyder. P. Zweifel.
Obituary notice of Heinrich Bayer. R. Freund.
Cultural experiments *in vitro* with human placenta. H. Guggisberg and W. Neuweiler.
*An explanation of the increased peripheral blood pressure in pregnancy and eclampsia. A contribution to the etiology of eclampsia. N. Louros.
Gas gangrene emboiism following abortion. E. Strassmann.

Incarceration of a retroflexed gravid uterus in the second month with symptoms of ileus. H. Graff.

Is secondary suture of the perineum to be recommended or not? T. L. Brandess.

Eclampsia and calcium. G. K. F. Schultze.

Remarks on Cukor's contribution "The importance of speed of sedimentation of erythrocytes in the conservative treatment of diseases of the adnexa". R. Grosz.

On Hellendall's work "The treatment of dangerous symptoms from the use of Lobelin 'Ingelheim' in the newborn". O. Lang.

On the influence of coitus and the early escape of the liquor amnii on the course of the puerperium. M. P. Liubimowa.

On the spontaneous origin of cervico-vaginal fistulæ and ruptures of the portio vaginalis in abortion and labour. P. I. Silin.

No. 23, *June* 5, 1926.

Interferiometric researches. H. Runge.

*On the question of sterilization for the pernicious anæmia-like anæmias of pregnancy. A. Reist.

Fatty degeneration of the endometrium apart from sexual maturity. H. Hartmann.

Primary tubal carcinoma. W. Beck.

On the possibility of producing injuries by aortic compression. G. Haselhorst.

Dicephalus tribrachius dipus. G. V. Zur Mühlen.

On postpartum hæmorrhage and its treatment. H. Lorenzen.

More on the question of the danger of lobelin for the newborn. J. Mennet.

On tubal implantation. R. Kiparsky.

Further experiences of tubal insufflation with special reference to the problem of sterility. A. Mandelstamm.

No. 24, *June* 12, 1926.

*The nin-hydrin flocculation test in pregnant women; a new serum reaction for the recognition of pregnancy. W. Vogel.

Contribution to the question of virulence of streptococci. F. Baake.

*Streptococcal serum therapy and the blood picture, with an attempt at the objective valuation of serum therapy in sepsis. H. Lehfeldt.

A multiple Krompecher carcinoma of the vulva with advanced elephantiasis. N. Temesvary.

Remarks on R. Remmelts: constitution and first labour in later age. G. Lundt.

Interruption of pregnancy and legal reform. A. Niedermeyer.

A case of pregnancy in amenorrhœa. L. Flory.

On uterine perforations. W. Buschmann.

Examination of the speed of sedimentation of erythrocytes in gynæcological diseases. I. J. Iwanowa.

No. 25, *June* 19, 1926.

Obituary notice of Carl Ruge. R. Meyer.

On the fibril content of the uterine mucosa in genital hypofunction as clinically diagnosed. I. F. Wermbter.

On osteogenesis imperfecta. W. Götz.

Is sex-prognosis after Lüttge and Mertz-Sellheim possible? K. H. Slotta.
An unusual birth injury and its consequences. E. Bettmann.
A case of mono-amniotic twins. K. Bihler.
The treatment of locked twins. U. Gehse.
Remarks on S. Loewe's: Qualitative and quantitative analgesia in its application to the female endocrines. O. O. Fellner.
Contribution to the therapy of tubal pregnancy. A. Mandelstamm.
Kermauner's reflex in parturient women. S. Galant.

No. 26, *June* 26, 1926.

Progress in the testing of 100 sera by Dienst's pregnancy reaction. K. Fink.
*Placenta accreta with multiple interstitial myomata. A. Ecke.
Unusual causes of peritonitis following Cæsarean section. H. Schultheiss.
Subcutaneous high transverse section of fasciæ. O. P. Mansfeld.
*The possibility of influencing suitable cases of primary female sterility by operative measures on the ovaries and tubal ostia. F. Isbruch.
On the technique of tubal sterilization. H. Peitmann.
Contribution to obstetric researches on head presentations relative to position, amount of liquor amnii and deflexion. A. Hochenbichler.
Compral, a new analgesic. F. Jaeger.
Autohæmotherapy in uncontrollable vomiting in pregnant women. A. I. Malinin.

No. 27, *July* 3, 1926.

Physical considerations of Landeker's ultra-violet treatment. v. Schubert.
The striæ of pregnancy and constitution. K. Seynsche.
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*On the etiology of rupture of the uterus during labour. L. Lederer.
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Rectal versus vaginal examination.

To ascertain how often internal examination is necessary and how

often rectal examination furnishes satisfactory information, Baumm investigated 864 obstetric cases. He found that internal examination was needed in about eight per cent. and in this group rectal examination was unsatisfactory in 80 per cent., especially in cases of placenta prævia and of prolapse of the umbilical cord.

Retroflexion and accident.

Raaflab's sign—bilateral tenderness in the inguinal regions, both spontaneously and on pressure—is regarded by Füth as a valuable diagnostic sign in recent traumatic retroflexion of the uterus.

A sign of probable pregnancy.

Gauss found his modification of Hegar's sign—abnormal mobility of the cervix in early pregnancy— present in 146 out of 148 pregnancies, and holds that it is rare apart from pregnancy.

The relation between the fœtal and maternal blood sugar.

Less sugar was found in the blood from the umbilical artery than in that from the vein and less in the latter than in the mother's blood.

Post-climacteric hæmorrhage and granuloma-cell tumour of the ovary.

Postclimacteric hæmorrhage in the absence of uterine lesions is an important early sign of ovarian tumour, especially of the granuloma-cell type. Schiffmann reports two such cases. He considers that hæmorrhages of this kind suggest this type of ovarian tumour, which frequently remains small for a long time. It would, therefore, seem a mistake to postpone operation until the appearance of a palpable tumour.

The vaccine therapy of gonorrhœa in women.

For refractory gonorrhœa in women, Wolff records good results with living vaccine, finding it superior in action to killed vaccine. He considers that patients weakened by chronic disease should not receive vaccine treatment, but for other chronic cases with no tendency to cure treatment with living vaccine is the treatment of choice.

Acid reaction of the vaginal secretion and gonorrhœa.

As the result of the examination of 123 cases, Stengel concludes that absence of the acid reaction might justify a suspicion of gonorrhœa, but that it cannot claim to be more than auxiliary in diagnosis.

My method and technique of anæsthesia in the treatment of abortion and other minor vaginal manipulations.

Gellert injects 10 cc. of a one per cent. solution of procaine with the addition of epinephrin into each side of the uterus in subfebrile and non-infected cases. Dilatation of the cervix becomes painless and easy and the tonus of the body of the uterus is not affected.

The treatment of septic puerperal fevers with large amounts of alcohol per os.

Küstner obtained good results in septic puerperal fevers by giving sufficient brandy and wine at the time of the expected chill, to produce deep intoxication. Two patients who vomited the alcohol died, whilst a third who also vomited it showed no improvement. Küstner considers that the alcohol retards metabolism and inhibits the growth of the infecting

organisms. In drunkedness the alcoholic content of the blood may reach 0.75 to 1 per cent, and experiments *in vitro* show that in concentration of of one per cent. of alcohol the growth of streptococci is checked, though they are not killed.

Adhesions in the cervix uteri after curettage.

Wolff records three cases in which atresia of the cervix followed post-partum curettage or the induction of abortion, and he recommends that in curetting the region of the internal os should be avoided, especially in the puerperal uterus.

Conservative treatment of febrile abortion by drainage.

Schwarz's method consists in introducing a strip of gauze, dry or wet with alcohol, into the cervical canal, reaching beyond the internal os, and changes it daily. This keeps open the cervical canal, provides drainage and causes the expulsion of retained fœtal tissue by exciting or maintaining uterine contractions. Usually five or six changes of gauze are necessary and a stay in hospital of fifteen to twenty days. This method is said to have been very successful in the Marburg Clinic and is now employed in all cases of infected abortion in which digital or instrumental evacuation of the uterus is considered too dangerous.

An explanation of the increased peripheral blood pressure in pregnancy.

Louros considers that constriction of the peripheral blood vessels in pregnancy is secondary to dilatation of the abdominal vessels caused by stimulation of the vagus. It is thus a vagotonia of the vascular system. Venesection in eclampsia relieves the abdominal vessels and lowers the compensatory high blood pressure. The changes in the liver and kidneys in eclampsia could also be explained by a vaso-constriction such as that which occurs in peripheral compensatory vaso-constriction. Vagotonia, however, exists in pregnancy; something more, therefore, is required to explain the phenomena of ecampsia and further investigations are being undertaken.

On the question of sterilization for the pernicious anæmia-like anæmias of pregnancy.

Owing to the danger of recurrence in future pregnancies, Reist advocates sterilization in the anæmia of pregnancy of the pernicious type if the patient has had several children, and the history suggests functional weakness of the bone marrow. He supports his contention by the record of one case of his own and a consideration of the literature.

The nin-hydrin flocculation test in pregnant women; a new serum reaction for the recognition of pregnancy.

Vogel makes a "standard solution" by dissolving bicarbonate of potassium in water and adding lime water. To 10 cc. of this solution are added 1.75 cc. of serum and 0.2 cc. to a one per cent. aqueous ninhydrin solution. This mixture is boiled in the water bath for three minutes, the albumen separates in coarse greyish-white shreds if the serum is from a non-pregnant woman, whilst in pregnant women it remains in suspension except in early pregnancy when very fine blue flakes appear. Vogel obtained a positive result in 97.8 per cent. of 281 pregnancies and a negative result in 97.7 per cent. of 212 non-pregnant women. In the first

three months of pregnancy it was positive in 75 per cent. Vogel claims for his test simplicity and reliability as good as that of the more elaborate serological tests for pregnancy.

Streptococcal therapy and the blood picture.

In the blood of patients with puerperal and surgical sepsis, Lehfeldt found a regression of lævo-deviation, a return of eosinophiles and a relative lymphocytosis two days after the injection of antistreptococcal serum. A similar blood picture was also observed in mice with experimental streptococcal infections following the administration of serum. He considers that the blood picture provides a test of the progress of streptococcal infections during serotherapy.

The possibility of influencing suitable cases of primary female sterility by operative measures on the ovaries and tubal ostia.

Following interpolar resection of the ovary for partial cystic degeneration or by a plastic operation for stenosis of the Fallopian tube, pregnancy resulted in 43.9 per cent. of primarily sterile women.

Placenta accreta with multiple interstitial myomata.

Ecke records the case of a woman aged 36 who had had menorrhagia four years, whose pregnancy terminated spontaneously at term twenty-one hours after rupture of the membranes and twelve after the commencement of pains. An attempt to remove the placenta manually for postpartum hæmorrhage was difficult as there were many interstitial myomata over which the placenta had become firmly incorporated with the abdominal wall. Vaginal hysterectomy was performed. The patient recovered. Ecke attribute the placenta accreta to the unfavourable influence of the interstitial myomata on the nutrition of the decidua.

The lactic acid content of the blood in pregnancy.

Employing the Mendel-Goldschreiner method for the determination of lactic acid in the blood in 37 pregnant and many non-pregnant women, Schultze found an average of 11 mgms.per cc. in non-pregnant women of 15 in pregnant women, of 25.5 in one case of eclampsia, and of 20.5 and 21.5 in two others with symptoms suggestive of impending eclampsia.

On the etiology of rupture of the uterus during delivery.

Lederer considers that rupture, although ascribed to various causes, is in reality due to microscopic changes usually infective in origin, which produce weakness of the tissues of the uterine walls.

On the question of carcimona of the stump after supra-vaginal amputation of myomatous uteri.

Isbruch records two cases of this condition, and reviews sixty-five cases in the literature. He considers that the advantages of the supra-vaginal operation need not be abandoned if search for microscopical malignant disease is made prior to operation in every case of myomata, and especially during the operation. The cervical stump should be short and should be examined occasionally for years afterwards to detect any incipient suspicious manifestations.

Manual removal of "firm" blood clots and membrane fragments from the uterus for post-partum hæmorrhage.

The bleeding in atonic post-partum hæmorrhages is ascribed to tenaciously adherent clots or scraps of membrane which cannot be dislodged by external manipulation. The ungloved hand is passed into the uterus without general anæsthesia and the adherent clots are detached one by one. The uterus then contracts vigorously and hæmorrhage is at once arrested, whilst the conditions are said to be less favourable for bacteria. These manipulations were required in two per cent. of the last 4,500 obstetric cases.

Diagnosis of lues by finding spirochætes in the umbilical cord on dark-ground illumination.

Philipp and Gornick scrape the wall of a vein near the peripheral end of the cord after it has been incised lengthwise. A drop of the tissue juice so obtained is examined by dark ground illumination. This technique excludes other spirochætes and settles the diagnosis. The finding of spirochætes usually coincides with the serological tests in the mother, and in only five out of fifteen cases in which spirochætes were found in the cord could none be detected in the placenta.

Development of lactic acid in the living human placenta and the lactic acid content of the blood in pregnancy.

Loeser finds that the lactic acid of the blood in pregnant women is always at the extreme upper limit of the normal, whilst in the toxicoses of pregnancy, from the the slightest to the most severe eclampsia, is much above the normal limit. In this he sees the advantages of that treatment of pregnancy toxicosis furnishes.

Salpingostomy plastic and pregnancy.

In Heimann's case pregnancy followed slitting the occluded fimrial end of the Fallopian tube, and suturing the mucosa to the peritoneum.

The significance of the inhalation of chloroform in the ætiology of intra-uterine asphyxia.

Seitz in 1903 reported that the administration of chloroform to the mother improves the condition of the fœtal labouring heart, probably by diminishing the pressure of the uterus on the fœtus during pains.

Louros and Miller administered five to eight drops of chloroform per minute in 39 cases in which the fœtal heart beat had become slowed during labour. In 16 of these cases the chloroform produced improvement of the fœtal heart and delivery was accelerated artificially. In all these cases there was obstruction to the circulation through the cord, which was looped once or twice round the neck, knotted and prolapsed. They suggest that chloroform can be used as a test which should be used in every case of intrauterine asphyxia with slowing of the fœtal heart. An absence of improvement as shown on auscultation during two successive intervals between pains indicates obstruction of the cord and the need for hastening delivery.

Premature separation of the normally situated placenta.

Prager gives the following as characteristic of a typical case of this condition :— 1. Sudden pain in the lower abdomen or back. 2. hæmorrhage—internal (concealed), external or both—with pallor, distress, fainting and impaired pulse; 3. Enlarged, hard, protruded uterus, so painful and sensitive that the fœtal parts and heart beat are recognised with difficulty; 4. Absence in the early stage of uterine contractions and even when labour is progressing great difficulty in distinguishing the contractions and relaxations of the uterus. The delivery of the child is quickly followed by that of the placenta, accompanied by recent and other blood clots. In cases with few symptoms, apart from slight antepartum hæmorrhage the diagnosis is established during labour by the detection in the placenta of saucer-shaped depressions to which old blood clot is attached on the maternal surface. Differential diagnosis from acute abdominal conditions outside the uterus *e.g.* appendicitis and torsion of tumour is difficult. Placenta prævia causes collapse in the absence of an "acute abdomen" uterine rupture occurs at a later stage.

In 100 cases reviewed by Prager, trauma, shortness of, or pulling on, the cord, and late rupture were not etiological factors. Among 50 cases there was albuminuria in all but 16. In a series of 100 twelve suffered from eclampsia during the present or a previous pregnancy. The least extensive detachments occurred in patients free from eclampsia.

Among 50 cases birth was spontaneous in 34 instances, with a maternal mortality of eight per cent. Autopsies and Cæsarean sections constantly revealed subserous and intramuscular hæmorrhages in the uterus, and frequently free bloodstained fluid in the abdominal cavity. The fœtal mortality was 60 per cent. a detachment of more than one half of the placenta was generally incompatible with survival of the fœtus .

Treatment of cervical carcinoma by radiation.

Fürst believes that poor results obtained by the radiation therapy of carcinoma of the cervix in the chief German and Swiss clinics is due to their scanty supplies of radium, and insists that both Röntgen and radium rays are essential. Preliminary exposure to Röntgen rays reduces the size of the tumour and wards off peritonitis by its bactericidal action. After operation radium should be used for the radiation.

Air embolism in Cæsarean Section.

Kraul records the fifth Austrian case of fatal air embolism in Cæsarean section. The pelvis had not been raised and the uterus had not been massaged, but after completion of the suturing of the lower uterine segment slight pressure had been applied to the fundus through the vagina. As the peritoneum was being sutured symptoms of suffocation suddenly supervened and the patient died. At autopsy the ovarian and renal arteries and the inferior vena cava were found greatly distended with air.

Galvanization of the atonic uterus.

Kraul uses galvanism in association with washing out the uterus for atonic conditions, using an egg-shaped perforated electrode 5 c.m. wide, mounted on a catheter.

On the morbidity and mortality of puerperal infection.

Konstantoff encountered puerperal infection in 1.7 per cent, of 8,000 labours at Charkow Maternity Hospital in the last thirty-two years. Two cases were fatal. Vaginal examination has been the routine procedure, the placenta being detached and removed manually on sixty-nine occasions with mortality nil and morbidity six per cent.

The progress of Menge's dilatation treatment for dysmenorrhœa.

Schwoerer and Wichmann treated 158 cases of primary dysmenorrhœa in which no genital abnormality other than a small uterus could be found by Menge's method of dilatation with the following results: 50 per cent. appeared to be cured permanently; 13 per cent were free from symptoms for at least twelve months; 22 per cent. found some relief and 15 per cent. showed no improvement. The results were better in women whose menstrual period lasted from three to six days than in those with longer periods. Hypersensitivity of the nervous system, psychic factors and genital hypoplasia account for most of the failures.

F. E. T.

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*On pre-climacteric and climacteric metrorrhagias and their treatment with X-rays. P. Freudenthal.

*Tubal pregnancy repeated on the same side. E. Peterson.

*Is labour induced by a fœtal stimulus? E. Jerlov.

*Heterotopic endometrial proliferation. C. Semb.

On pre-climacteric and climacteric metrorrhagias and their treatment with X-rays.

The author insists on the importance of preliminary curettage and histological examination. Glandular hyperplasia of the endometrium strongly indicates X-ray treatment if other factors are favourable. The treatment consisted in: 80-100 Holznecht units in 4-5 series with three weeks interval. Filter 3-4 mm. Aluminium. Initial dose 24-30 H.

Tubal pregnancy repeated on the same side.

This is a case of tubal pregnancy having recurred on the same side where four years previously salpingectomy had been performed for ruptured tubal pregnancy. A small portion of the Fallopian tube had been left behind and had now become the seat of a fresh gravidity.

Seven similar cases have been collected from the literature, six of which were of the same kind as the one described above, while the seventh was one of interstitial pregnancy following tubal gestation.

The author recommends that the entire Fallopian tube and uterine horn should be removed, in order to prevent such sequelæ.

Is labour induced by a fœtal stimulus?

A series of experiments are described, showing that blood taken from the umbilical cord immediately after birth contains substances which promote the activity of a guinea pig's uterus to a greater extent than other blood as well as that of the mother.

The experiments were so arranged that the blood was immediately defibrinated and then diluted with equal parts of Ringer's solution. The uterus of a freshly-killed guinea pig was placed in the mixture—oxygenated and maintained at 39 C.—and its contractions recorded.

The author is of the opinion that these results are strongly indicative of the stimulus to labour under normal conditions originating from the fœtus.

Heterotopic endometrial proliferation.

An enquiry was made into the pathogenesis of the endometrium-like tissue in "tar-cysts" of the ovaries. In the cyst-walls were found remains of follicular epithelium with transitions to endometrioid tissue. In secluded follicles in the ovarian remains there were small collections of early formations of endometrioid tissue. The epithelium in the tar-cysts is, therefore, assumed to be developed from follicular epithelium. The cytogenous stroma is formed from the ovarian connective-tissue, generally from the theca folliculi. The author found no evidence in favour of Sampson's implantation theory or in support of the theories generally advanced to explain the "endometrial tar-cysts."

A. Gough.

Kinki Fujinkwa Gakkwai Zassi.

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Experimental researches on the sensibility (reactility) of pregnant animals. F. Hazama.
*The influence of the ovary on anti-body formation. J. Sano.
Pharmacological investigations on the choralised uterus. M. Shinagawa.

Involution of the uterine mucosa in the puerperium.

The study of the involution of the puerperal uterine mucosa was undertaken by the author who took the entire mucosa along with muscle fibre of the superficial zone by means of curettage in 150 cases of normal puerperal women, doing this every day for 35 days of the puerperium, and made systematic histological observations with results as follows:—

1. In the puerperal period the compact and the spongy surface are necrosed and the necrosis does not appear till seven days after the puerperium.

2. At the beginning of the puerperal period the superficial epithelium of the compact and of the gland cells in the spongy surface is immediately regenerated, but the regenerated epithelium dies eventually and is regenerated again from the gland cells of the lower layer of the spongy zone.

3. The uterine glands are regenerated and multiplied from the deep seated glands.

4. Cell infiltration is distinct in the puerperium, plasma cells and brown pigment cells appearing, especially after seven days. The former three weeks after the beginning of the puerperium decreases gradually, the latter are still recognisable after thirty days and the pigment shows an iron reaction.

5. The mitoses of the stroma cells are evident from four days after the puerperium and the gland cells and superficial epithelium appear distinctly after nine days.

6. At the beginning of the puerperium, the superficial epithelium and the gland cells die by vacuolization and hyperchromatosis of the nucleolar walls. The luxuriant growth of the epithelium is of the synplasmatic type.

7. The decidual cells, except those of the deep-seated spongy zone, almost all die and are generally no longer to be recognized after 14 days.

8. Most of the muscle fibres contract by absorption of glycogen and fat, although no fibres are seen to disappear absolutely.

9. The walls of the bloodvessels become thickened, with organized thrombus and hyaline degeneration.

10. The glycogen and fat, except that which appears in the degenerate cells are as a rule temporary, and this explains the retrogression of the functions of the cells.

11. In the early stage after the puerperium Suzaki could diagnose by examination of the uterine mucosa whether the uterus had been in puerperium or not; in the later period, however, positiveness on that point was not advisable.

The blood-sùgar content in hyperemesis gravidarum.

Estimating the sugar in the blood in eleven cases of hyperemesis gravidarum, Kuto found hyperglycæmia (0.143 per cent.) to be present and to disappear within fifteen hours of the production of artificial abortion.

Comparative study of the pharmacological sensibility of extirpated rabbit-uteri.

Investigating the minimal doses of some medicaments and their pharmacological action in non-pregnant, pregnant and puerperal conditions, Tani and Hazama found that:—

1. In the pregnant rabbit-uterus, the sensibility of the peripheral nervous system declines more than that of the non-pregnant uterus, but the sensibility of the muscular system does not change.

2. On the first day of the puerperium the sensibility of the peripheral nervous system is still strong, which is to be considered as a result of delivery. The contraction of the uterus, besides assisting in expelling the rest of the contents from the cavum uteri and checking the bleeding from the wall of the uterus may be expected to increase the density of the nervous and muscular systems. The decline in the sensibility of the peripheral nervous system after the second day may be due to degeneration of the uterus.

On the serum lipase of pregnancy, labour and the puerperium, with special reference to pregnancy toxicoses.

By stalagmometric investigations, Mizuhara found a decline in the amount of serum lipase present during the first half of pregnancy, which persists throughout labour and the puerperium and is especially well marked in cases of pregnancy kidney, and in tuberculosis during pregnancy.

The serum lipase is also diminished in the new-born child, especially when premature.

On the study of fat in the blood and lipolyptic ferment in the blood serùm of tùberculous women.

Yoshida found that:—

1. The amount of lipase in serum from non-pregnant tuberculous women decreases remarkably in comparison with healthy serum; and it increases or decreases parallel with the rate of progress of the disease and general conditions.

2. The lipase content in serum of tuberculous pregnant women

decreases also in comparison with healthy pregnant women; and it decreases most in cases wherein the progress of tuberculosis is greatest.

3. The amount of fat in the blood, especially cholesterol, increases more or less with non-pregnant tuberculous women in whom prognosis seems to be good; and it decreases below the normal with patients in whom the course of disease is worse and the prognosis bad.

4. With tuberculous pregnant women, the total sebacic acid in blood generally decreases, in comparison with healthy pregnant women. And the cholesterol tends to increase.

5. Both the lipase in serum and the fat in blood, with tuberculous pregnant women, increase or decrease simultaneously in relation with the degree of the disease and general conditions.

6. With tuberculous pregnant women, whose lipase-amount in serum decreases, the fat-amount in blood tends to increase.

7. Among the tuberculous women in child--bed, those whose course after operation is favorable, show an increase of lipase in the serum and of fat in the blood. And those whose course is bad show no quantitive change in either of them; or decreases in both simultaneously.

Experimental study of the changes in the female genitals caused by diet and its influence upon fertility.

Experimenting with various deficient dietaries, Susaki found that the histological changes in the genitals of female rats fed on polished rice, and on diets deficient in protein were comparatively slight in spite of the animals suffering from severe innutrition. They nevertheless showed superior fertility, with which the various vitamins appeared to have no direct connection. In the majority of cases, however, both parent and offspring died in labour or suffered miscarriage, premature birth, or absorption of the fertilized ovum. Hence, fertility in the female under deficient nutrition and successful parturition do not go together.

Examination by Röntgen photographic process of puerperal involution.

By radiological examination, Susaki found that in the earlier puerperal period ante-position and ante-version were present, but that later, the the frequency of retro-version increased. He concludes that one of the causes of secondary uterine retro-version must be acting during the puerperium.

The influence of the ovary on anti-body formation.

Sano found that castration, transplantation and the injection of ovarian extracts produced no decided effect on normal or immune hæmolysis or on normal or immune agglutination, and concludes that the ovary exerts no effect on anti-body formation.

F. E. T.

REPORTS OF SOCIETIES

THE ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

A Meeting of the Section of Obstetrics and Gynæcology of the Royal Society of Medicine was held at the Society's house 1, Wimpole Street on Friday, October 15th. The President, Dr. ARCHIBALD DONALD was in the Chair.

Professor Louise McIlroy read notes of cases of :—

(1) MALIGNANT DISEASE OF BOTH OVARIES IN A GIRL OF 18 YEARS AND

(2) ENDOMETRIOMA OF THE OVARY..

The President delivered an Inaugural Address in which he gave a brief outline of some of the outstanding points in the history of obstetrics and gynæcology in his adopted city of Manchester. He paid tribute to past Manchester gynæcologists, mentioning Charles White, Charles Clay, (who was recognized as the father of ovariotomy in Europe; he performed his first operation in 1839, sixteen years before Sir Spencer Wells did his first ovariotomy,) Charles Cullingworth, (who later became the gynæcologist of St. Thomas Hospital,) and Sir William Sinclair. He next proceeded to discuss the best known gynæcological practices at the Manchester School compared with those of other parts of Great Britain, emphasising :—

1. The treatment of prolapse by vaginal plastic operations only.
2. The more frequent use of the operation of curetting and its various indications.
3. The limited use of operations for the suspension or fixation of a retroverted uterus.
4. The practice of removal of the ovaries in all cases of hysterectomy, even when the ovaries are healthy. This practice is almost universally adopted in Manchester, unless the patient insists on one or both ovaries being left.

Mr. VICTOR BONNEY read a paper on :—

"THE OUTCOME OF 214 RADICAL ABDOMINAL OPERATIONS FOR CARCINOMA OF THE CERVIX PERFORMED FIVE OR MORE YEARS AGO."

(This paper will be published in full later). It was discussed by Dr. CUTHBERT LOCKYER, Professor FLETCHER SHAW, Mr. L. C. RIVETT and Dr. RUSSELL ANDREWS.

Meeting held on November 19th, 1926, at the Society's house, the President, Dr. ARCHIBALD DONALD in the Chair.

Professor HENRY BRIGGS read the notes of :—

A CASE OF ASCITES OF UNKNOWN ORIGIN DURING PREGNANCY.

A previously healthy woman of forty who had four children, had amenorrhœa for eleven months. She was seen for increasing size of the abdomen, which was due to ascites. There was marked albuminuria. The uterus was enlarged and could be felt as an abdominal tumour. Laparotomy was performed, the uterus being removed and the ascitic fluid drained away. No cause for the ascites could be found in the peritoneal cavity. The patient made an uninterrupted recovery.

The case was discussed by Mr. T. G. STEVENS, who described a patient who had been under his care during three successive pregnancies, and in each there was enormous increase in size of the abdomen due to ascites. On each occasion the patient had a normal full-time delivery and no cause for the ascites could be found at any time. After the first and second pregnancies the ascites rapidly disappeared, but remained for a long time after the third child. The fluid was removed by tapping, and no further accumulation occurred. The patient has since been lost sight of.

The PRESIDENT and Mr. A. BOURNE also discussed the condition.

Professor BECKWITH WHITEHOUSE showed a patient on whom :—

THE TREATMENT OF OVARIAN CARCINOMA WITH PERITONEAL METASTASES BY TRANSFUSION OF MATERNAL BLOOD AND INJECTIONS OF RADIATED ASCITIC FLUID had been carried out. The patient, aged 48, mother of five children who had had her right breast removed in October, 1924, for scirrhus, consulted Professor Whitehouse in March, 1926, for abdominal distension and progressive weakness. Her abdomen was much distended by ascites, and several hard tumours could be felt in both the upper and lower abdomen. A large mass filled the pelvis and extended above the pubis. The abdomen was opened on March 23rd, and the ovaries were found to be replaced by masses of growth which had also infiltrated the omentum and studded the visceral and parietal peritoneum with nodules. The greater part of the ovarian masses was removed, but a portion attached to the left side of the pelvis remained; it was about the size of a billiard ball.

The ascitic fluid was collected in a sterile vessel and exposed to 100 mgms. of radium element in 1000 cc of the fluid for twenty-four hours. At the end of the operation the patient was transfused with one pint of blood from a healthy young woman at the tenth week of her normal pregnancy. The patient recovered well from the operation, and has since been treated by subcutaneous injection of 10 cc. of the radiated ascitic fluid regularly, twice weekly. The dose was reduced to 5 c.c. in October, and recently stopped completely. In all, 500 c.c. have been injected. Each injection of ascitic fluid was followed by a marked general reaction.

The patient has subsequently done very well. There has been no recurrence of the ascites, the masses of growth easily felt in the abdomen have disappeared, and the deposit left in the position of the left ovary and referred to above, cannot now be felt. The patient's general condition has improved strikingly, and Professor Whitehouse said that it was, of course, too early to express any opinion as yet as to the final result, but that the result so far had been very encouraging.

The treatment introduced two different methods of dealing with malignant disease. (*a*) The introduction into the circulation of a syncytiolysin, by the transfusion of blood from a patient at a period of pregnancy when such a substance, if existent, is presumably most active. (*b*) The employment of a cancer cell vaccine, by utilisation of the available ascitic suspension, in which the malignant cells have been destroyed by radium and not by heat.

The communication was discussed by the President, Dr. H. R. Spencer, and Mr. S. Forsdike.

Dr. ALFREDA H. BAKER read a paper illustrated by a demonstration on the Epidiascope on :—

THE CAUSES AND PREVENTION OF ANTENATAL, INTRA-NATAL, AND NEO-NATAL DEATH.

by herself and Professor LOUISE MCILROY. This paper will be published in full later : it was discussed by Professor F. J. Browne and Mr. Eardly Holland.

Professor Louise McIlroy demonstrated an apparatus for stimulating respiration in the new-born infant by giving it oxygen and carbon dioxide.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held in Liverpool, October 15th, 1926. The President, Mr. W. GOUGH (Leeds), in the Chair. Present, 24 members and 3 visitors.

Dr. C. P. BRENTNALL (Manchester), showed slides illustrating Endometrioma of the anterior abdominal wall.

He said, "I have no macroscopical specimen to show, but there are two slides under one of the microscopes shewing sections of what in most respects was a typical endometrioma in a single woman of thirty-seven.

There was a large tumour obliterating the pouch of Douglas, and adherent in the usual way to the rectum. Both ovaries were enlarged and filled with typical old hæmorrhagic fluid. The Fallopian tubes in their whole length were apparently normal. There were innumerable small scattered nodules over the visceral peritoneum of both small and large intestine, and in several places adjacent coils of bowel were firmly adherent. In addition there was a single nodule in the anterior abdominal wall one inch above the umbilicus, and half an inch to the right of the middle line. Its size was about that of a filbert, and the tumour was firmly imbedded in the rectus muscle. The peritoneum was adherent and puckered up in the same way that the peritoneum over a small endometrioma at the bottom of the pouch of Douglas is puckered. The tumour was not attached to skin. There was no capsule.

There are two slides, one shewing a section through the tumour of the adbominal wall, the other a section from an ovary. There is nothing special to note in the microscopical appearance. There are the usual gland spaces lined by columnar epithelium, surrounded by darkly staining interstitial cells. I have not found any recorded instance of a tumour of this nature situated so far distant from the uterus.

One other point, the fact that the ovaries were not adherent, in other words, had not perforated, suggests that they had not acted as an intermediate host for the spread of the tumour over the peritoneal cavity, as suggested by Sampson.

I ought to say that the woman had had no previous operation, and this nodule in the abdominal wall does not fall into the same class as those occurring in an abdominal scar."

Dr. J. W. A. HUNTER (Manchester), asked if there were chocolate fluid in the growth.

Dr. LEITH MURRAY (Liverpool), asked if the umbilicus was normal.

Dr. BRENTNALL replied that there was no chocolate fluid. The umbilicus was normal.

Dr. H. LEITH MURRAY (Liverpool), demonstrated a specimen of

PRIMARY CARCINOMA OF THE APPENDIX

He said, "Although the specimen shown is not gynæcological, it seems important that gynæcologists, who have a greater opportunity than other surgeons of seeing the appendix, should appreciate that primary carcinoma of the appendix may present itself as a very inconspicuous lesion.

The specimen shown was rather casually removed from a patient aged forty-two, in the course of an operation for apoplexy of the right ovary and vaginal prolapse. It was of average length, non-adherent, and showed only very slight thickening in the terminal $\frac{1}{2}$ inch; it could hardly have been described as having a "blobby" tip. Sections show this half inch to be solid, and microscopically, there is clear evidence of an unencapsulated spheroidal-celled carcinoma replacing the whole of the mucous coat, and extending in places from the musculature as far as the peritoneal coat.

This is a true primary carcinoma, and is distinct in its features from the much more frequent and relatively innocent carcinoid of the appendix.

As there was no suggestion at the time of operation that the appendix was malignant, no search was made for glands."

Dr. BRENTNALL (Manchester), had seen a similar case in a boy aged twenty. The symptoms were the same as in a case of acute appendicitis.

The PRESIDENT then described a case of Labour obstructed by a diverticulum of the rectum.

Professor BRIGGS (Liverpool), thought it was not proved that the mass was not a dermoid cyst opening into the rectum above.

Dr. DOUGAL (Manchester), asked if there were a ligature passing between the horns of the bicornuate uterus, which might have dragged up the rectum in development.

The PRESIDENT replied.

A CASE OF RUPTURE OF THE BLADDER DURING LABOUR WITH FATAL PERITONITIS was described by Miss DUVAL (Liverpool), on behalf of Professor GLYNN and herself.

The patient was admitted on April 27th, 1926, to one of Dr. Leith Murray's beds at the Chatham Street branch of the Liverpool Maternity Hospital, and Professor Glynn and I have to thank him for permission to present the case.

She was a primigravida, aged twenty-nine, and had been a regular attendant at the ante-natal clinic attached to the hospital during her pregnancy. Her pelvic measurements were normal, and the urine, which had been tested weekly for some time, had no abnormal constituents.

On admission she was at full time, the os one finger dilated, the head well down in the pelvis, the position L.O.A.

During the next three days she had intermittent labour pains. The membranes were ruptured at 6 p.m. on May 1st, and the os was three-quarters dilated at 8 p.m. At 3 a.m. on May 2nd, the patient is stated to have given a piercing shriek, and complained of acute abdominal pain. The nurse felt the uterus then, and there was no contraction, but the patient was rather cold and clammy.

Following this, the patient became somewhat hysterical, and the house surgeon was sent for at 6-30 a.m. As the labour had been long, and the interest of the child seemed to demand it, low forceps were applied under chloroform anæsthesia, and the patient was easily delivered of a living male child weighing 6 lbs. 5 ozs.

A perineal tear of the second degree occurred, and was repaired. The third stage occupied one and a half hours, and the placenta and membranes were delivered by manual expression. The condition of the patient was then considered satisfactory. It is noteworthy that the patient passed urine voluntarily just before the anæsthetic, and that no urine was obtained on the pasage of a rubber catheter before the application of the forceps.

Apparently the patient's condition gave rise to no anxiety during the next twenty-four hours, but as she passed no urine during that time, she was catheterised, and eight ounces of "smoky" urine, which is said to have contained no blood or albumen, was withdrawn.

On the following day, the patient passed eight ounces of urine voluntarily at 2 a.m., and six ounces again at 2 p.m.

By the evening she had become very ill, the complexion sallow, the temperature 100.2°, the pulse rapid and almost imperceptible, and the respirations quickened. The abdomen was much distended and very tympanitic, and there was pain in the left iliac region.

The usual restoratives were given, but she was much worse by the next morning, with a frequent brownish green vomit and incontinence of fæces. She died at 10.55 a.m., three days and five hours after delivery.

I made a *post mortem* examination in the presence of Professor Glynn, seven hours after death. The body was extremely corpulent, the subcutaneous fat of the abdominal wall being fully three to four inches thick. This must have made an accurate diagnosis of the abdominal condition during life extremely difficult. The peritoneal cavity contained about six pints of turbid and slightly blood-stained fluid smelling strongly of urine, and containing large flakes of recent fibrin. The intestines were distended to about double their normal size, and the peritoneal coat was injected. On examining the bladder, a small oval perforation which would just admit the points of a Spencer-Wells forceps, the edges of which were gangrenous, was discovered on the posterior surface about midway between the fundus and the utero-vesical reflection, and half an inch from the mid line. Radiating from the hole were three rents involving the serous and muscular coats, but not the mucous membrane. On slitting open the bladder from the front, the perforation was seen to be surrounded by an area containing numerous small hæmorrhages. Apart from this, the lining epithelium appeared to be normal, as did also the ureters and their orifices. The kidneys and other organs showed no evidence of disease. The uterus was uninjured except for a deep right-sided

cervical tear. The cause of death was undoubtedly rupture of the bladder followed by peritonitis.

When and why did this accident occur? It must be a very unusual one, as after a good deal of search I can only find two cases recorded, in which intra-peritoneal rupture occurred actually during the course of full-time labour. The first of these is a Liverpool case, reported to this Society at Manchester in 1905, by Dr. GRIMSDALE, and afterwards published in the *Journ. Obstet. and Gyn.* Vol. VII, p. 354. The second is in 1908 by C. P. PORTER in *Trans. Obst. Soc. Lond.*, Vol. 49, p. 171.

Time does not permit of giving the details of these cases, and it must be sufficient to say that both of them present many similar features to this one, *e.g.* the patients were primigravidæ with no pelvic contraction and no definite history of urinary disease. Both had instrumental deliveries, and in both the rupture was situated as in our case, on the postero-superior wall of the bladder, and was considered to have been spontaneous, and to have occurred prior to the application of forceps.

I will now briefly set out the facts of this case in relation to the possible cause and time of occurrence of the rupture.

First, as to the cause :—

1. There is no clinical evidence of pre-existing urinary disease, and the naked eye and microscopical examination of the urinary organs is in accordance with the history.

   With the exception of the bruised area around the perforation, the lining of the bladder appears normal. Professor Glynn considered at the *post mortem* that 'the wall', however, was somewhat thinner than normal. The thickness of the muscular and mucous coats empty measures just over 2 mm. The normal measurement is 6.8 mm. Had there been cystitis, it would have been visible in the trigonal area which is obviously free from disease.
2. The microscopical section taken from the uninjured portion of the bladder shows no pathological condition except some congestion of the sub-mucous vessels, (the absence of epithelium cannot be adduced as evidence of disease, and it has occurred in a control specimen subjected to similar *post mortem* conditions and methods of preparations). The section taken from the bruised area shows recent extravasation of blood throughout all the layers, it is, in fact, the picture of a bruise. The muscle is not diseased, and there is no inflammation.
3. The situation of the lesion makes direct injury by the forceps unlikely. In a primigravida at any rate, this portion of the bladder would have been in the abdomen. Instrumental injury in stiff forceps cases occurs to the base, and here there is no evidence of any trauma.
4. The presence of distension at any time during the labour is not shown in the history, but the first stage was prolonged, and the patient may not have been properly emptying the bladder throughout. She was so fat that distension, if present, would not have been observed.

Second, as to the time of rupture :—

1. The gangrenous edges of the perforation.
2. The degree of peritonitis found at *post mortem*. In view of the fact that the urine was certainly not grossly infected, acute peritonitis would not follow very soon after the rupture. The chart also is consistent with an ingravescent sepsis.

3. The amount of urine obtained after delivery was only 22ozs. in three days. A curious point is the ability shown by the patient on two and possibly three occasions to pass urine voluntarily, presumably after rupture. In view, however, of the very small leak, this must not be considered an impossibility.
4. Lastly, there is the history of the cry uttered by the patient three hours before delivery, followed by the complaint of acute abdominal pain.

In our opinion, all these facts point to the rupture having occurred prior to, or at the time of delivery, the cause being increased intra-abdominal pressure due to the pains of labour in a bladder probably overdistended, and therefore weakened, but certainly not otherwise diseased.

It will be interesting to know if members have had similar cases, and also their views on this one.

Professor BRIGGS asked if the temperature was low before labour.

The PRESIDENT considered that the rupture occurred when the patient cried out.

Professor BLAIR BELL (Liverpool), thought there was no hysteria about the case, that the smoky urine had been of great significance, and that if the urine had been measured it would have been of aid in diagnosis.

PROFESSOR BLAIR BELL described two cases :

(1) Bilateral squamous celled carcinoma of ovaries and peritoneum subsequent to vaginal hysterectomy for carcinoma of cervix.

(2) Squamous celled carcinoma of ovaries and peritoneum subsequent to carcinoma of cervix treated by radium.

Mrs. C. M. W. Aet. 55. M. Nullipara. Menopause at 40. Consulted doctor in March, 1926.

April 14th, 1926. Vaginal hysterectomy performed by Gynæcologist for cancer of the cervix. Prognosis considered unfavourable

September 15th, 1926. Was brought by her doctor to Liverpool. Patient looked very ill, and she complained of a "sickening pain" in the lower abdomen. She also said her indigestion was so bad that she had difficulty in taking food, and had only had fluids lately. She stated that she was very weak.

Examination. A very large tumour was found occupying the whole of the right side of the abdomen from just below the ribs to the symphysis. Free fluid was present. On vaginal and rectal examination a scar was felt crossing the vault of the vagina transversely, and a large soft tumour filled the pelvis on the left side.

September 22nd, 1926. Operation was performed and bilateral, partly cystic, partly soft solid tumours were removed. The left was adherent to the bladder. Nodules of growth were discovered in the pelvis at the vault of the vagina, and metastases were observed in the liver.

Pathology. The tumours consisted of malignant cells derived from squamous epithelium. There was much necrosis with softening.

Comment was made on the extreme rarity of such tumours in the ovary.

Mrs. L. L. Aet. 62. An American lady. Widow. 5-para. Menopause at 51.

April, 1921. Complained of vaginal hæmorrhage. Radium inserted by Gynæcologist. Cervix sloughed away.

Nov., 1921. Examined by Gynæcologist and authority on radium treatment under anæsthesia: uterus found to be freely movable. Section showed chronic inflammation only. Kept under observation.

May, 1924. Abdomen found to be enlarging. Diagnosis indefinite.

October, 1924. Laparotomy performed and widespread malignant dissemination noted. Deep X-ray therapy.

February 9th 1926. Patient came under our care. She was found to have large masses of growth scattered about the abdomen, and free fluid was present.

February 24th, 1926. Laparotomy to remove larger portion of growth. Free fluid. Pelvis occupied by ovarian growths. Nodules and masses in peritoneum and in omentum. Both ovaries removed.

Pathology. Ovarian growths consisted of squamous celled cancer.

Comment. Apparently cervical cancer cured by radium, but growth of similar character developed subsequently in the ovaries, and from them became disseminated in peritoneal cavity.

The PRESIDENT emphasised the rarity of malignant growths in the ovaries secondary to carcinoma of the cervix, but not in the case of cancer of the corpus uteri.

Dr. LEITH MURRAY doubted if the growths shown were actually squamous celled carcinomata. They appeared to him to be columnar-celled.

Professor BRIGGS agreed with Dr. Murray.

It was decided to refer the matter to a Pathological sub-committee.

Dr. Hunter gave an account of a case of

SUB-PERITONEO-PELVIC PREGNANCY WITH HYDRAMNIOS.

He said, "The following case presents several unusual features from the aspect of pathology, diagnosis, and treatment, and I am indebted to Dr. W. FLETCHER SHAW for permission to record the case.

Mrs. A. Aet. 30. 3-para. Housewife. Admitted to St. Mary's Hospital, Manchester, on August 23rd, 1926.

Her last menstrual period was on March 16th, 1926, and was followed by several weeks of irregular bleeding for which she was curetted in one of the outlying hospitals, a diagnosis of incomplete abortion having been made. After curettage the bleeding ceased, and she was sent home, but shortly afterwards she noticed a gradual increase in the size of the abdomen. About the beginning of July she had a sudden attack of acute pain in the abdomen with sudden enlargement of the swelling, and accompanying the pain were recurrent attacks of vomiting and faintness. During the six weeks prior to admission there was progressive abdominal enlargement with increasing tenderness and recurrent attacks of severe abdominal pain often accompanied by vomiting. Six days before admission there was slight loss of blood from the vagina. Beyond these, increasing frequency of micturition and gradually increasing constipation were the only symptoms of which she complained.

Condition on admission. Patient was rather pale, collapsed and obviously in considerable pain. Her pulse was small and rapid, the rate varying between 120 and 140, and the temperature was 100°.

Examination of the abdomen showed it to be enlarged to the size of an eight months pregnancy, the tumour was extending almost

to the ensiform cartilage. The swelling tended to occupy more the left side of the abdomen than the right, and was hard, rather fixed and extremely tender, the whole picture closely resembling that of a concealed accidental hæmorrhage. On palpation it was possible to elicit fluctuation in the upper left portion, but the mass in the right iliac fossa was quite hard and solid. Percussion did not show any dulness in the flanks, and on auscultation no fœtal heart sounds or movements could be heard.

Vaginal examination was unsatisfactory on account of the extreme pain and tenderness, but suggested a firm mass continuous with the cervix occupying the lower right quadrant of the abdomen, and a large cystic mass inseparable from it above and to the left.

The diagnosis lay between concealed accidental hæmorrhage and a twisted ovarian cyst complicating early pregnancy. The possibility of an abdominal pregnancy was considered, but rather discounted in view of the previous curettage and absence of other signs.

Patient was kept under observation for twenty-four hours, but did not improve, in fact, became rather worse. Operation was then decided upon, a diagnosis of twisted ovarian cyst complicating early pregnancy having been made.

On opening the abdomen on 24th August, 1926, a large rather thick walled cyst was seen almost filling the peritoneal cavity, the latter also containing a large amount of recent fluid blood and old blood clot. On extending the incision the "cyst" was seen to be arising from the left broad ligament which had been stretched and lifted up, while the uterus—enlarged to the size of a three months pregnancy—was closely opposed on the right side. On attempting to separate the "cyst" it was found to be adherent to the abdominal wall in front and to the omentum and small intestine above and behind, and during this separation the anterior wall suddenly gave way and a large quantity of liquor followed by a living male child came out. The gestation sac was composed of a much stretched out broad ligament anteriorly, while posteriorly it had burrowed under and lifted up the cœcum and mesentery of the small intestine, and the right colic artery was running in the wall of the sac. The placenta was hurriedly removed, and the sac packed with gauze and marsupialised. During removal of the placenta there was very little bleeding, but there was considerable hæmorrhage in the abdominal cavity, probably from a torn branch of the right colic artery.

After operation, the patient was very collapsed and failed to respond to treatment, dying shortly after return to the ward. The child, weighing $2\frac{1}{2}$ lbs., was quite normal and lived fourteen days.

The case presents several unusual features. On looking over the history it appears certain that the so-called incomplete abortion for which she was curetted was in reality an early ectopic gestation, and very possibly rupture of the sac into the left broad ligament occurred during this manipulation. Secondly, the associated hydramnios almost excuses the mistake in diagnosis, for even when the cyst was exposed it was impossible to palpate the fœtus through its walls. To avoid a fatal result was very difficult in view of the manner in which the "sac" had displaced the mesentery and bowel, and even had she recovered from the operation, intestinal obstruction would have almost inevitably ensued.

One is inclined to wonder whether incision of the sac, emptying the

contents and immediate packing instead of an attempt to free it from the surrounding adhesions would have given the one chance of a successful result.

Dr. Willett (Liverpool), remembered a case at five months. He considered it safer to leave the placenta, though recovery would be tardy.

Dr. Dougal remembered a case of full-time ectopic pregnancy on which the late Dr. Clifford and he operated. The placenta was removed and the patient made a good recovery.

Dr. Brentnall also described a case of abdominal pregnancy at four months.

Dr. J. W. Bride (Manchester), described two cases of malignancy in association with genital prolapse.

CASE 1. CARCINOMA OF THE CERVIX AND EPITHELIOMA OF THE VULVA.

The patient, Mrs. F. H., had six children, the last ten years ago. Her age was fifty. Menstruation had been 4/28 type and profuse, the last two months ago. She consulted me in June, 1921, complaining of a bad discharge, brownish and watery, and of something coming down. She had never worn a ring. On examination, I found that she had complete prolapse with hypertrophy and severe ulceration of the cervix. I operated on her on June 10th, 1921, and though I did not consider the cervix definitely malignant, I decided to remove the uterus by vaginal hysterectomy in the course of an extensive anterior colporrhaphy according to Fothergill's method. The pathologist's report was that there was a columnar-celled carcinoma of the cervix. She made an uninterrupted recovery.

The patient did not visit me again till April, 1925, four years from the date of operation, though I heard from time to time from her family doctor that she had no further trouble. On examining her now, I found no sign of any recurrence of growth in the pelvis, but she was complaining of a small ulcer on the right labium majus, obviously epitheliomatous and fixed. She said she first noticed irritation and then ulceration in December, 1924. I excised the vulva and glands on April 8th, 1925, and microscopical examination showed it to be a case of epithelioma of the vulva.

Recurrence took place at the end of that year, and radium was applied on two occasions. Her doctor tells me that she died about two months ago. There was recurrence from the cervical carcinoma.

Firstly, it seems to be generally allowed that malignancy of the cervix is rare in association with genital prolapse. Cullen[1] regards the incidence of the two condition as accidental, and does not consider that prolapse predisposes to carcinoma. He quotes Pantow[2], who reviewed the literaautre in 1893, finding only twenty-nine cases in all of which the prolapse preceded the carcinoma.

Secondly, the unlikelihood of there being any connection between the primary columnar-celled carcinoma of the cervix, and the vulval epithelioma is important.

Thirdly, this case illustrates that vaginal hysterectomy may still be regarded as holding out almost as good a hope of cure as the abdominal total extirpation.

REFERENCES.

1. Cullen,T. S., "Cancer of the Uterus." 1900, p. 120.
2. Pantow, G,. "Carcinoma Uteri Prolapsi.," Inaug Diss Berlin, 1893.

CASE 2. PRIMARY CARCINOMA OF THE VAGINA AND PROLAPSUS UTERI.

The patient, Mrs. L. C., was married and had four children, the first twenty-nine, the last twenty-three years of age. All the labours were normal. She had noticed something coming down since the birth of the first child. For the last five to six years this has been getting worse, and she has worn a rubber ring pessary during that time. Menstruation ceased eleven years ago, but three years ago she stated that she had a profuse attack of bleeding for three weeks, and has had a slight brownish discharge at times since.

When I saw her in June, 1926, she had, against advice, retained her rubber ring pessary No. 3 for ten months. On removing it in a very offensive condition, I found a large raised bleeding plaque on the lower middle part of the posterior vaginal wall. I diagnosed epithelioma of the vagina, and immediately admitted her to hospital.

On June 6th, she was anæsthetised, and Prof. Fothergill looked at the growth. It was an oval plaque with raised hard edges and crater-like centre, about 2 inches long by 1½ inches wide. We agreed that the growth appeared fixed to the rectum, and was probably not operable and best treated by radium. However, being anxious for a section of it I proceeded to perform posterior colporrhaphy including the growth in the flap and with great difficulty dissected it off the rectum, though it was right on to the rectal mucosa. Previously to this I curetted the uterus, and found no malignant disease of the body, and I removed the cervix which was examined and found innocent. The growth is a primary squamous celled carcinoma of the vagina.

Dougal[1] at Liverpool, in October, 1922, described a case of primary carcinoma of the posterior vaginal wall treated by hystero-vaginectomy where the growth occupied the upper two thirds of the wall. In summarizing the literature he mentions that Meyer, Schmit and Winckel have each described a case possibly due to pessary irritation. It seems possible that my case may have originated from the same source, as there was neglect on the patient's part to have the pessary removed and cleansed at proper intervals, as instructed.

The patient was discharged on August 2nd, and before leaving hospital, radium was applied. She was seen again by the Radiologist on September 2nd, and was found satisfactory, and will report again for radium later.

For a growth situated in the lower part of the vagina, possibly this very simple operation together with radium may effect a cure.

REFERENCE.

1. Dougal D., Trans. North of England Obstet. and Gyn. Society, 1922.

The President recalled a case of epithelioma of the vulva which came under his care fourteen years after the cervix had been scraped and cauterised elsewhere for carcinoma of the cervix.